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BOOK III.

OF THE THEORY OF THE SUPERCUNDITY OF HUMAN BEINGS: ITS NUMERICAL ERRORS STATED AND DISPROVED.

CHAPTER I.

INTRODUCTORY.

(1) It is a recommendation of the prince of ancient philosophers, when treating on a subject not unconnected with the one under consideration, that our "suppositions should be possibilities[1];" which, in an argument that has so much to do with futurity, and is necessarily governed by so many contingent events, is hardly less important than the rule, which ought to be universal under all circumstances,—that our statements should be truths. It is much to be regretted that neither of these maxims has been sufficiently attended to by the advocates of the prevailing theory of population, even in treating upon those essential points on which the question manifestly depends. We have already seen, that, had the population of the American colonies, in the earlier periods of their history, been carefully ascertained from existing documents of an official character, and faithfully presented to the public, accompanied by an account of the extraneous accessions which it has perpetually received, (a course which none can deny ought to have been adopted,) the utter irreconcileableness of its rate of increase with any geometrical ratio whatsoever, would have become instantly apparent, and the sole proof, therefore, upon which the entire theory rests, overturned. I now proceed to shew, for a still higher purpose than that of adding confirmation to a conclu-

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[1] Aristot. De Repub. l. ii. c. 4.

sion already so fully demonstrated, that, even in those parts of the system under examination, which seem to rest upon calculation, the grossest errors, often, indeed, involving impossibilities, prevail; and that, not on points of little moment, but on the most important and fundamental positions.

(2) The present Book of this treatise will, therefore, be devoted to the detection of some of the more important of these errors and miscalculations, beginning with the rates of doubling, so confidently put forth, as natural to an unchecked population. Due examination will shew, beyond the possibility of doubt, that the periods of duplication assigned by the anti-populationists, as those in which mankind would increase if unchecked, and even the longest of them, which they repeatedly assure us prevails at the present moment in the United States of America, are, in every instance, and under the most favourable circumstances, impossibilities. The same will be proved of any geometric ratio of human increase whatsoever. The effect of emigration on population; the supposed prevalence of the preventive check in this and other countries; the effect of mortalities on the number of marriages, and of scarcities on their prolificness, with several other subjects essential to the theory under consideration, will also be separately examined; when, it is believed, a series of errors will be exhibited rarely equalled, in either number or magnitude, in any system which has met with such general attention. The Book will conclude with some remarks on the incorrectness of any opinion formed concerning the future increase of population, by that which has apparently taken place during the present century.

CHAPTER II.

OF THE POSSIBLE PERIODS OF HUMAN DUPLICATION.

(1) It becomes necessary to examine, with attention, the supposed ratios of human increase, as, notwithstanding we are repeatedly told that the "evils of "population" are in present and perpetual operation, still we are emphatically referred to the future for their more complete development. These ratios invest the Principle of Population, as lately expounded, with its prospective terrors, and furnish the panoply of the theory. It is by these, that this inexorable system, after having pronounced what it presumes to be the sentence of Nature, warns the human race of its speedy execution. In the fears thus excited, the reason and experience of mankind are silenced, and even the evidence of their senses disregarded: a little time may, therefore, not be misapplied in reducing this political bugbear, thus exaggerated by fear and ignorance, to its proper dimensions, previously to its being shewn to be a phantom altogether. It will then be seen, that if any geometric ratio of human increase did exist as a law of nature, still it would be of a very different character from any of those now put forth, affording mankind ample time to contemplate the event, and provide for its consequences.

(2) In proceeding, therefore, to the examination of some of the fundamental errors in the calculations of the theory I am combating, for the twofold purpose of still further shaking the confidence of the public in a notion so hostile to their well being, and

of preparing the way for a contrary principle of population about to be developed, I shall commence with the supposed periods of doubling, so confidently relied upon by our anti-populationists, and so perpetually asserted by them as matters of fact; without the least attempt to prove them within the range of possibilities.

(3) In pursuing this branch of the inquiry, I shall principally confine my remarks to the elaborate work on population so often referred to, in which indeed the assertions of previous writers on the same side of the question are very faithfully copied, and, I regret to add, the opinions of others but too frequently misinterpreted. Generally speaking, there is a considerable degree of indefiniteness in the expressions of its author in reference to these various terms of doubling, not, as it should seem, from any apprehension of exaggerating the rates of human increase, but rather from a reluctance to acknowledge the quickest of them equal in effect to the unchecked power of the principle for which he contends. In the commencement of his work, however, he gives forth a ratio of increase sufficiently rapid to satisfy the most sanguine on the subject, in these words: "Sir William Petty 'supposes a doubling possible in so short a space as ten years.'"

(4) The credit of Sir William Petty demands, that this quotation from him should be accompanied by his own explanation. His supposition is a mere comment upon some observations in the then recent work of Major Graunt upon the Bills of Mortality, and the hypothesis demands, that every female between the age of fifteen and forty-four should "bear a child once in two years;" and, moreover, that the deaths should be only one fifth part as numerous as the

births! He had before been calculating, from other recorded particulars, a ratio of increase which would not double the population in less than twelve hundred years, and likewise gives us "other good observations" of an intermediate nature; and at length "to get out of this difficulty, and to temper these vast disagreements," he takes a medium of his own, the effect of which is to double the population, under existing circumstances, in 360 years, the conclusion to which he adheres. It must be further remarked, that though, in this calculation, he does not forget the checks, still he pronounces them to be, in their effect on the population during that period, "of no great matter to the whole nation[1]."

(5) But to remove all doubt or ambiguity as to the opinion of Sir William Petty on the subject, the term in question, ten years, is the one fixed upon by him in the same treatise as that in which "the people might have doubled;" when? during the first hundred years after the flood, and then only; as he trebles that term before the conclusion of the succeeding century, and at length enlarges it to twelve hundred years. His avowed object in asserting ten years as a possible term of human duplication, was to "justify the scriptures concerning the number of people in ancient time;" and he no more omitted in his calculation the astonishing longevity and prolificness of the period in question, as recorded in the Bible, than all other writers who, with a similar object, have availed themselves of the same facts. It is clear, therefore, that the age to which Noah arrived has as little to do with the present expectation of life, as it is termed, as the quotation from Sir William

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[1] Petty, Tracts, pp. 108—120.

Petty has with the period of doubling now-a-days, however free mankind might be from the checks so often alluded to. These remarks are made with a view of clearing that judicious writer from the absurdity thus imputed to him.

(6) Whatever might have been the opinion of Sir William Petty on this subject, it is clear that the author I am principally combating adopts one very similar to that attributed to him, and puts it forth under the sanction of a calculation of Euler's; though I think with as little reason as in the former case; the circumstance of that eminent mathematician having computed a table exhibiting the increase of human beings under different circumstances (a task, however, to which any arithmetician would have been fully competent) and terminating it with proportions which would double a population in 12⅘ years, is no stronger a proof that he supposed that term to be the natural one, than that he so determined with regard to a period of 250 years with which he commences. Just as reasonably might we hold the interest tables of an accountant, calculated from an eighth to five and twenty per centum, to be valid proof of his belief that the interest of money vacillates between, and touches upon such extremes. He adds to this appeal to Euler's Table, these words: "and these proportions" (which double a population in 12⅘ years) "are not only "possible suppositions, but have actually occurred "for short periods, in more countries than one." I proceed to disprove this supposed possibility altogether, which I hope to do in such a manner as will render any reference to these unmentioned countries quite unnecessary.

(7) I shall first premise that these doublings are of course meant to be represented as the result of

" procreation only," and, indeed, the one under consideration is so explained, viz. as produced solely by the excess of the births, compared with the deaths, of the entire community. Otherwise they would have no more to do with a general argument on the natural increase of population, than the annual reports of a foundling hospital, or the arrival of a cargo of convicts in New South Wales. And, again, by these "possibilities" nothing further can be meant than the established average proportions of nature, placed under the most favourable circumstances. It would be futile and disingenuous in the highest degree, to select particular and extraordinary instances of longevity and fecundity, and transfer them, in such calculations as these, to an entire population; but the statement relieves itself from any such imputations by asserting the fact in question of a whole country, and of more countries than one. I beg leave to recall to the reader's recollection what has been said in a former section of this treatise, on the exactness and certainty of these operations of nature calculated on their totality, however dissonant they may seem, when individually taken; and how much more moderate are the average results, than the vague computations we generally form by contemplating particular instances; extraordinary cases being very naturally those which make the most powerful impression upon us, and are always the most present to our recollection.

(8) Previously to entering upon the calculations to which these supposititious doublings will be submitted, I shall notice two capital errors in the computations of those who have professed to prove their possibility, which have been necessarily fatal to the accuracy of their conclusions. The first is, making the prolific portion of the community (always a small

part of the entire number) the radix of all their calculations, to the total exclusion of the sterile and even effete part of it; (confining the use of the latter term to those who have ceased to be fruitful.) The second is, fixing upon the precise period when this small proportion of the whole number begins to be productive, as that from which to commence their doublings. This method, to be sure, fully answers their purpose in shewing an extraordinary rate of increase, which, having thus obtained, they transfer to an entire population; such a method of calculation is, however, utterly useless for any purpose whatsoever, least of all will it demonstrate the possibilities in question. It assumes that there are no aged persons in an entire community who have survived the reproductive period of life; that there are none weakly or deficient; and, moreover, that there are no infants or children more or less remote from the period of fruitfulness, of whom a considerable portion is never destined to attain to it. Such calculators generally commence with Melchizedeks; they present to us their prolific pairs unincumbered with father or mother; and, like ephemera, propagating as soon as they appear, and disappearing when they have ceased to propagate. It is quite superfluous to dwell upon the absurdity of these suppositions, and yet it is from a series of impossibilities like these, that the "possibilities" about to be examined are made up.

(9) Bearing these necessary considerations in mind, I have, at some considerable pains, attempted to ascertain the degree of prolificness necessary, on the average, to effect this quick period of doubling which Mr. Malthus vouches to have taken place for short periods, in more countries than one. I have done this, not by reasonings, which surely ought never to

be admitted as evidence in questions which arithmetic can alone decide, but by constructing many different tables in order to trace the whole question clearly and distinctly, and as, I trust, without any risk of material errors: these have cost no little time; but I cannot conceive it wholly mispent in proving the utter absurdity of the preliminary suppositions on which the geometric ratio of human increase is professedly founded.

(10) The following table, then, will exhibit, soon after its commencement, for a long series of years, an increase in births, independently of extraneous accessions, amounting, very accurately, to a doubling in the period in question, once every 12⅘ years, certainly not exceeding that ratio of multiplication. The results, only, are in this instance given, as it would have occupied too much space to insert the whole of the details; a course, however, which will be adopted in another and more important stage of the argument.

TABLE XVI.

SHEWING THE PROLIFICNESS REQUIRED IN ORDER TO DOUBLE A POPULATION IN 12⅘ YEARS.

Effete population	·96
Fruitful ditto	4·
	4·96

Year.	Marriages.	Births.	Total Births.	Year.	Marriages.	Births.	Total Births.
1	2	..	..	8	..	2	8
2	..	2	2	9	..	..	8
3	..	..	2	10	..	2	10
4	..	2	4	11	..	..	10
5	..	..	4	12	..	2	12
6	..	2	6	13	..	..	12
7	..	..	6	14	..	2	14

Year.	Marriages.	Births.	Total Births.	Year.	Marriages.	Births.	Total Births.
15	..	..	14	46	..	1½	94
16	..	2	16	47	1½	7	101
17	..	..	16	48	..	3	104
18	..	2	18	49	2	6	110
19	..	..	18	50	..	5	115
20	..	2	20	51	2½	5	120
21	..	..	20	52	..	7½	127½
22	1	..	20	53	3	4	131½
23	..	1	21	54	..	10½	142
24	1	..	21	55	3½	3	145
25	..	2	23	56	..	14	159
26	1	..	23	57	4	2	161
27	..	3	26	58	..	18	179
28	1	..	26	59	4½	1	180
29	..	4	30	60	..	22½	202½
30	1	..	30	61	5	..	202½
31	..	5	35	62	..	27½	230
32	1	..	35	63	4½	..	230
33	..	6	41	64	¼	31½	261½
34	1	..	41	65	4	¼	261¾
35	..	7	48	66	¾	34½	296¼
36	1	..	48	67	3½	1	297¼
37	..	8	56	68	1½	36½	333¾
38	1	..	56	69	3	2½	336¼
39	..	9	65	70	2½	37½	373¾
40	1	..	65	71	2½	5	378¾
41	..	10	75	72	3¾	37½	416¼
42	..	..	75	73	2	8¾	425
43	½	9	84	74	5¼	36½	461½
44	..	½	84½	75	1½	14	475½
45	1	8	92½	76	7	34½	510

Year.	Marriages.	Births.	Total Births.	Year.	Marriages.	Births.	Total Births.
77	1	21	531	107	$43\frac{1}{2}$	$148\frac{1}{16}$	$2799\frac{13}{16}$
78	9	$31\frac{1}{2}$	$562\frac{1}{2}$	108	$5\frac{9}{16}$	$167\frac{1}{2}$	$2967\frac{5}{16}$
79	$\frac{1}{2}$	30	$592\frac{1}{2}$	109	$51\frac{7}{8}$	$135\frac{3}{8}$	$3102\frac{11}{16}$
80	$11\frac{1}{4}$	$27\frac{1}{2}$	620	110	$4\frac{11}{16}$	$218\frac{1}{8}$	$3320\frac{13}{16}$
81	..	$41\frac{1}{4}$	$661\frac{1}{4}$	111	60	$121\frac{5}{16}$	$3442\frac{1}{8}$
82	$13\frac{3}{4}$	$22\frac{1}{2}$	$683\frac{3}{4}$	112	$4\frac{11}{16}$	$275\frac{5}{8}$	$3717\frac{3}{4}$
83	..	55	$738\frac{3}{4}$	113	$67\frac{1}{2}$	$107\frac{1}{4}$	3825
84	$15\frac{3}{4}$	18	$756\frac{3}{4}$	114	$5\frac{7}{8}$	$338\frac{3}{4}$	$4163\frac{3}{4}$
85	$\frac{1}{8}$	$70\frac{1}{2}$	$827\frac{1}{4}$	115	74	$94\frac{7}{8}$	$4258\frac{5}{8}$
86	$17\frac{1}{4}$	$14\frac{1}{4}$	$841\frac{3}{8}$	116	$8\frac{5}{8}$	$405\frac{3}{4}$	$4664\frac{3}{8}$
87	$\frac{1}{2}$	87	$928\frac{3}{4}$	117	$79\frac{1}{8}$	$86\frac{1}{4}$	$4750\frac{5}{8}$
88	$18\frac{1}{4}$	$11\frac{1}{8}$	$939\frac{1}{2}$	118	$13\frac{3}{8}$	$474\frac{3}{8}$	5225
89	$1\frac{1}{4}$	$103\frac{3}{4}$	$1043\frac{1}{4}$	119	$82\frac{1}{2}$	$83\frac{7}{8}$	$5308\frac{7}{8}$
90	$18\frac{3}{4}$	$9\frac{3}{8}$	$1052\frac{5}{8}$	120	$20\frac{5}{8}$	$541\frac{7}{8}$	$5850\frac{3}{4}$
91	$2\frac{1}{2}$	120	$1172\frac{5}{8}$	121	$83\frac{3}{4}$	$90\frac{3}{4}$	$5941\frac{1}{2}$
92	$18\frac{3}{4}$	$9\frac{3}{8}$	1182	122	$30\frac{15}{16}$	605	$6546\frac{1}{2}$
93	$4\frac{3}{8}$	135	1317	123	$82\frac{1}{2}$	$110\frac{7}{16}$	$6656\frac{15}{16}$
94	$18\frac{1}{4}$	$11\frac{3}{4}$	$1328\frac{3}{4}$	124	$44\frac{11}{16}$	660	$7316\frac{15}{16}$
95	7	148	$1476\frac{3}{4}$	125	$79\frac{1}{8}$	$146\frac{1}{8}$	$7463\frac{1}{16}$
96	$17\frac{1}{4}$	$17\frac{1}{4}$	1494	126	$62\frac{1}{4}$	$703\frac{7}{8}$	$8166\frac{15}{16}$
97	$10\frac{1}{2}$	$158\frac{1}{4}$	$1652\frac{1}{4}$	127	$74\frac{1}{32}$	$201\frac{5}{16}$	$8368\frac{1}{4}$
98	$15\frac{3}{4}$	$26\frac{3}{4}$	1679	128	$83\frac{3}{4}$	$734\frac{13}{32}$	$9102\frac{21}{32}$
99	15	165	1844	129	$67\frac{11}{16}$	$279\frac{1}{2}$	$9382\frac{5}{32}$
100	$13\frac{3}{4}$	$41\frac{1}{4}$	$1885\frac{1}{4}$	130	$109\frac{1}{16}$	$750\frac{7}{32}$	$10132\frac{3}{8}$
101	$20\frac{5}{8}$	$167\frac{1}{2}$	$2052\frac{3}{4}$	131	$60\frac{21}{32}$	$383\frac{7}{8}$	$10516\frac{1}{4}$
102	$11\frac{1}{4}$	$61\frac{7}{8}$	$2114\frac{5}{8}$	132	$137\frac{13}{16}$	$750\frac{7}{8}$	$11267\frac{1}{8}$
103	$27\frac{1}{2}$	165	$2279\frac{5}{8}$	133	$53\frac{5}{8}$	517	$11784\frac{1}{8}$
104	9	$89\frac{3}{8}$	2369	134	$169\frac{3}{8}$	737	$12521\frac{1}{8}$
105	$35\frac{1}{4}$	$158\frac{1}{4}$	$2527\frac{1}{4}$	135	$47\frac{7}{16}$	$680\frac{1}{2}$	$13201\frac{5}{8}$
106	$7\frac{1}{16}$	$124\frac{1}{2}$	$2651\frac{3}{4}$	136	$202\frac{7}{8}$	$710\frac{7}{16}$	$13912\frac{1}{16}$

(11) The above table, fairly examined, exhibits the ratio of increase predicated—not indeed according to the methods of calculation pursued by our modern political computists; not if we imagine an entire community without any portion of either age or infancy, and all made up of breeders on the very eve of their prolificness; a state of things which never occurred nor can occur in any period however short, nor in any district, much less "in more countries than one." It is, therefore, plain that we are not to commence our use of this table with the year one, and make the four individuals who marry in that year the radix of our calculation, to the exclusion of the $\frac{96}{100}$ (less than one individual) which represent the proportion of the aged and effete population belonging to the first couples according to the principle of prolificness assumed. Neither are we to leave out of the question an infant portion of existence as belonging to the same number of prolific individuals. It is superfluous to repeat that a certain proportion only of every general community is actually, or even possibly, prolific; that proportion Major Graunt, one of our earliest writers on the subject, fixed at one-eighth part of the whole for the metropolis; Dr. Price, generally, at one-fourth. Now, if we commence with the year 10 in the foregoing table, when the first couples shall have produced half their children only, whilst their eldest offspring already born will themselves form the marriage union only two years after their parents shall have ceased to be prolific, we shall have, in a number of less than eleven individuals, four of them in a state of actual prolificness, (to what degree remains to be explained,)—a state of population more favourable to human increase than ever existed in any country upon earth, at least since the patriarchal ages as recorded in the scriptures.

(12) In the year 10, the number of the living will amount to $14\frac{8}{10}$, ($\frac{16}{100}$ of the effete having died since the year one); from that period the table admits of nine of these doublings in the term of $12\frac{4}{5}$ years each, which bring us down to a little beyond 126. The geometrical progression would amount to $7577\frac{6}{10}$, or (to omit the fractions in future) to 7577; but the actual number found in the table is 7463 only. Two years afterwards, viz. in 12, the numbers in existence are 16.8, which, doubled as before, give us for the year 127, 8601 persons, but the number in the table is 8368: two years further, and the 18.8 found in the year 14, when doubled nine times, amounts to 9625; but in the year 129, 9374 only appear. Again, in the year 16 there are 20.8, which, similarly doubled, would multiply to 10,649;—there are 10,509 in the table. Commencing in like manner in several successive years afterwards, the numbers at each period thus doubled every $12\frac{4}{5}$ years, and those the table represents as actually existing, will be found very nearly balancing, till in some time afterwards the latter, I think, will rather exceed the former, in consequence, as I conceive, of the relation of the terms with the commencement of the series: then, again the geometric numbers would exceed. On the whole, therefore, we may assume that the table represents with sufficient exactness the increase of a population advancing in the rapid manner already mentioned; let us now, therefore, attend to the particulars of its construction, in order to determine the asserted possibility of such a multiplication in any country, under any circumstances whatsoever.

(13) This table, which, as before shewn, scarcely exhibits so rapid a rate of increase as that under consideration, is calculated on the following extraordinary data: First, all marry, and at the age of twenty; Second,

all the marriages are prolific, and to the astonishing extent of ten children each, one with another; Third, all these marriages are prolific the ensuing year, and thence in alternate years for eighteen subsequent ones, till the number of ten children each is produced; Fourth, none of these numerous offspring die unmarried, but, on the contrary, they all live to form that union at the same early age, and in their turn become equally prolific, a state of increase, in short, in which every individual in the third descent has one hundred, and in the fourth a thousand descendants, and so on through all succeeding generations; Lastly, must be added a fact relative to this calculation not a whit more surprising than those previously mentioned,—there are to be no deaths in this miraculously multiplying community! Then we find that a doubling every 12⅘ years is barely made up. Can an alleged calculation of Euler's, or the vague appeal of Mr. Malthus to the experience of some unnamed country or countries, redeem this ratio of human increase, constructed as it must be upon such assumptions, from the derision it merits?

(14) But even the proportion of prolificness to the population in this extraordinary rate of increase falls vastly short of that demanded in the table to which Mr. Malthus appeals,—and of deaths, as before observed, there are none; but if we allow to each of our parents of ten children a life of sixty-five years duration, (the only rational supposition advanced), and then account for them as deaths, the results will be still wider from the suppositions in question. This will fully appear on a further examination of the preceding table, when divided into equal periods throughout, adding a column for the mean annual number of deaths in each; I shall likewise insert another, exhibiting in

instance the utmost possible proportion of marges under such circumstances; the preventive check; t is called, having no existence whatsoever.

TABLE XVII.

HICH THE PRECEDING ONE IS DIVIDED INTO SECTIONS OF EIGHT EARS, SHEWING THE ANNUAL PROPORTIONS OF THE MARRIAGES, RTHS, AND DEATHS, TO THE EXISTING POPULATION THROUGHOUT.

ns.	Mean annual No. of Marriages.	Mean annual No. of Births.	Mean annual No. of Deaths.	Mean amount of Pop. in each term.	Annual prop. of Marriages, 1 in	Annual prop. of Births, 1 in	Annual prop. of Deaths, 1 in	Increase per Cent. each term.
8	.25	1.	.02	8.84	102	13	442	90
- 16	0.0	1.	.0	16.8				
- 24	.25	.25	.1	23.85	95	38	238	42
- 32	.5	1.75	.0	32.5	65	18	,,	36
- 40	.5	3.75	.0	56.5	113	15	,,	74
- 48	.375	4.875	.5	90.75	242	19	181	60
- 56	1.375	6.875	.0	132.375	96	19	,,	46
- 64	2.281	12.812	.0	205.687	90	16	,,	55
- 72	2.687	19.343	.75	333.75	124	17	445	62
- 80	4.687	25.468	1.	511.25	109	20	511	53
- 88	8.203	39.937	.875	778.47	95	19	889	52
- 96	11.015	69.312	1.75	1231.625	112	18	703	58
- 104	15.422	109.375	3.75	1935.812	126	18	516	57
- 112	26.578	168.593	4.5	2982.312	112	18	663	54
- 120	43.953	266.625	5.5	4631.5	105	17	842	55
- 128	67.629	406.487	10.625	7264.687	107	18	684	56
- 136	106.062	601.187	18.594	11267.562	106	19	660	55
propor- ns	17.162	102.295	2.822	1853.192	108	18	656	56$\frac{56}{100}$

(14) The preceding calculations, therefore, I repeat, exhibit very different proportions to those quoted from Euler, which are, "a mortality of 1 in 36, and the births to the deaths as 3 to 1," or, in other words, 1 birth in every 12, which, it is added, would double the population in the time specified, as has been known to have been the case in different countries. In the table, which hardly increases at that rate even exclusive of the deaths, no such proportions are found; there, on the whole average, there is only one birth in 18, and after the deaths of the recorded births are included, there is not one in 600! and the further the computation is carried, the less fluctuation is observable, and certainly no indication of material alteration in these proportions or of any acceleration in the increase. To augment the number in the column of the deaths, by transferring to it a part of that of the births in their infancy, it is evident would be fatal to the doubling in 12½ years. How then are the proportions mentioned as those of Euler to be obtained, so as still to preserve the duplication which is its basis? In one method only, and that so as in some measure to reconcile the relative proportions in question to the laws of nature, though presenting them in a series of the grossest exaggerations; by increasing the number of births one-half, and assigning a third of the whole as the proportion of the born that do not live to marry: most writers, including Dr. Franklin, fix that proportion at one-half; Mr. Malthus, I observe, at considerably more than two-fifths, under circumstances highly favourable to human increase. If we place these deaths in the octennial section in which they were born, considering the number that inevitably die in the first stages of infancy, it will allow some of them to survive to the age of puberty; and, lastly, the column of the population will have to receive these births for the

purpose of making the proper addition to its mean annual amount: the mean proportions of the last table will then be rectified as follows.

TABLE XVIII.

EXHIBITING THE MEAN PROPORTIONS IN A POPULATION DOUBLING EVERY 12⅘ YEARS, IN WHICH THE BIRTHS ARE AS ABOUT 1 TO 12, AND THE DEATHS AS 1 TO 36.

	Mean Annual Number of Marriages.	Mean Annual Number of Births.	Mean Annual Number of Deaths.	Mean amount of Population.	Annual prop. of Mar. 1 in	Annual prop. of Births, 1 in	Annual prop. of Deaths, 1 in
	17.162	102.295	2·822	1853.192			
Additions explained		51.147	51.147	51.147			
Corrected mean proportions . .		153.442	54.029	1904.339	111	12	36

(15) We have thus arrived, by exact calculations, at the particulars necessary in an entire population, to establish, from the given proportion of births and deaths, the rate of increase with which Mr. Malthus commences; and of which, he not only pronounces the possibility but the actual occurrence in repeated cases, and they are these:—All must marry, and at as early a period as twenty years of age; all the married must be fruitful, and to the extent of fifteen children each: of these fifteen children, as many as ten must live to marry, and at the same early age, and must in their turn be equally prolific; and so on. Every father, therefore, must be the parent of fifteen children in the first descent, of 165 in the second, of 1665 in the third; and if he could survive till he had seen the last complete their quota to this state of prolificness, he would reckon upon 16,665 great-great-grandchildren. Moreover, it must be observed, that these are the bare aver-

age numbers demanded in order to this ratio of increase from every married individual. I leave to the reader's imagination how far, therefore, even this state of fecundity must be enlarged to make up for cases of positive or comparative sterility in the married, and for those marriages which would be dissolved by premature mortality, before they had produced the given number of children, all which occurrences, it must be borne in mind, are as common and as inevitable, in all communities, as death itself: he will not readily overrate the addition that must of necessity be made to the medium of fifteen children, in order to make up that average as resulting from the totality of cases.

(16) To those who are at all acquainted with the structure of a community, in regard to the ages and condition of the individuals of which it is necessarily composed, the foregoing demonstrations will appear superfluous. The bare terms in which the proposition is stated, namely, one birth in every twelve, are of themselves abundantly sufficient to refute it; it is, in fact, precisely coincident with the assertion that all married females shall, on the average, have fifteen children. The proportion involves a physical impossibility.

(17) The same author, still copying from others, without due examination, has mentioned in yet more confident terms a somewhat extended period of doubling; which, though rather less remote from possibility, is nevertheless very far removed from it. Alluding to the often recited increase in American population, he says, " It cannot be doubted that, in particular districts, " the period of doubling, from procreation only, has " often been less than fifteen years."

(18) This term is given forth with so much confidence, is represented to be of such frequent occurrence and is so precisely limited to what is the only question

before us, that is, the natural increase of a community from procreation only, that I have been induced to examine it, also, with the attention necessary to ascertain the prolificness it demands. In assuming that what is meant by less than fifteen years, may perhaps be about fourteen, or rather, somewhere between fourteen and fifteen, I conceive I cannot be accused of misinterpretation; to find out, therefore, the circumstances necessary to realize this ratio of increase, I constructed several other tables, similar to the first of the preceding ones, when the following appeared to answer the purpose with sufficient exactness.

TABLE XIX.

SHEWING THE PROGRESS OF A POPULATION, DOUBLING BETWEEN EVERY 14 AND 15 YEARS.

Year	Marriages.	Annual Births.	Total.	Year	Marriages.	Annual Births.	Total.
Surviving progenitors.			1¼	14	..	2	19¼
				15	..	..	19¼
1	2	..	5¼	16	..	2	21¼
2	..	2	7¼	17	..	..	21¼
3	..	..	7¼	18	..	..	21¼
4	..	2	9¼	19	..	..	21¼
5	..	..	9¼	20	..	..	21¼
6	..	2	11¼	21	..	..	21¼
7	..	..	11¼	22	1	..	21¼
8	..	2	13¼	23.	..	1	22¼
9	..	..	13¼	24	1	..	22¼
10	..	2	15¼	25	..	2	24¼
11	..	..	15¼	26	1	..	24¼
12	..	2	17¼	27	..	3	27¼
13	..	..	17¼	28	1	..	27¼

Year	Marriages.	Annual Births.	Total.	Year	Marriages.	Annual Births.	Total.
29	..	4	31¼	60	..	21	166¼
30	1	..	31¼	61	3	..	166¼
31	..	5	36¼	62	..	23	189¼
32	1	..	36¼	63	2½	..	189¼
33	..	6	42¼	64	¼	24	213¼
34	1	..	42¼	65	2	¼	213¼
35	..	7	49¼	66	¾	24	237½
36	1	..	49¼	67	1½	1	238½
37	..	8	57¼	68	1½	23	261½
38	..	..	57¼	69	1	2½	264
39	..	7	64¼	70	2½	21	285
40	..	..	64¼	71	½	5	290
41	..	6	70¼	72	3¾	18	308
42	..	..	70¼	73	..	8¾	316¾
43	½	5	75¼	74	5¼	14	330¾
44	..	½	75¾	75	..	14	344¾
45	1	4	79¾	76	7	10½	355¼
46	..	1½	81¼	77	..	21	376¼
47	1½	3	84¼	78	9	7½	383¾
48	..	3	87¼	79	..	30	413¾
49	2	2	89¼	80	10½	5	418¾
50	..	5	94¼	81	..	40¼	459
51	2½	1	95¼	82	11½	3	462
52	..	7½	102¾	83	..	51	513
53	3	..	102¾	84	12	1½	514½
54	..	10½	113¼	85	⅛	61½	576
55	3½	..	113¼	86	12	⅝	576⅝
56	..	14	127¼	87	½	71	647⅝
57	4	..	127¼	88	11½	⅝	648¼
58	..	18	145¼	89	1¼	78¾	727
59	3½	..	145¼	90	10½	1⅞	728⅞

Year.	Marriages.	Annual Births.	Total.	Year.	Marriages.	Annual Births.	Total.
91	2½	84	812⅞	98	3¾	26¼	1116¾
92	9	4⅜	817¼	99	15	71	1187¾
93	4⅜	86	903¼	100	2½	41¼	1229
94	7	8¾	912	101	20¼	61½	1290½
95	7	84	996	102	1½	61¼	1351¾
96	5¼	15¾	1011¾	103	25½	51	1402¾
97	10½	78¾	1090½	104	1½	86¼	1489

(19) Using this table as the preceding one, and consequently commencing the doublings at such periods as present the state of the population in some conformity with that which invariably exists in its natural progress, that is, containing a certain proportion of aged as well as infant existence, (though no general condition of society will be found so favourable to increase as that which is the least so in the foregoing document;) and we shall find that the numbers do not double every fourteen years. Thus if we commence with the sixth year, when the first couples have had only three children each, not half the number assigned them, as will be hereafter explained, seven doublings of fourteen years each will reach to the termination of the table, and will amount to 1440, more than the number in existence according to the actual calculation, if any adequate allowance be made for mortality, there being only a surplus of forty-nine. But to leave mortality out of the question, from the eighth year, the same number of doublings would amount to 1656; the table, if carried to that time, (the 106th year,) would fall short of that amount. In like manner, taking six doublings of fourteen years each from the tenth year, in which we find 15¼ individuals,

and the sum is 966; but in the year 94, only 912 appear. Two years further, or from 12, six doublings of 17¼ come, in the 96th year, to 1104, instead of 1011, the actual number. In the next periods, the 14th and 16th years, the doublings amount to 1232 and 1360; the sums in the table to 1116 and 1229 only, the totals of the years 98 and 100, in which those doublings respectively terminate. All this while, the deaths have been omitted to be subtracted from the sums given from the table; a neglect which the king of terrors will not be guilty of for a hundred years together, as it regards any community in our world. I am fully warranted, therefore, in saying, that the above table, when thus fairly applied, exhibits a population increasing in a duplicate ratio, of which the term is more than fourteen, "and less than fifteen years."

(20) But the data on which this table is founded are hardly less surprising, and, certainly, not at all less impossible, than those already mentioned. In this case all must still marry at 20 years of age: all the married must be fruitful to the degree of eight children each: every child must live, and become in turn the parent of eight children, marrying as before, and proving equally fruitful; no deaths, in the meantime, are accounted for in this table, and then we see a population which will double "in less than fifteen years." Need the reader be again reminded of the additions which must be made to this measure of prolificness likewise, if this rate of increase is to be sustained, in order to make up for the deaths which occur in infancy, for the impotent and weakly portion of the community who never marry, for the number of absolutely sterile or comparatively unprolific marriages, and for those marriages dissolved by death before they have contributed their proportion to the general stock of

existence? Upon the most favourable suppositions ever yet hazarded, far beyond half the number of children assigned as the average prolificness of marriages in the preceding table must be added to it, perhaps nearer double that sum, in order to afford eight marrying and fruitful children for the average to every such union. Between fourteen and fifteen must be the least number in every such family, according to a calculation of Mr. Malthus's subsequently noticed. I hardly need add, that these, compared with the former suppositions, necessary as they are to the periods of doubling examined, are but the balance of equal impossibilities.

(21) But we are informed, that "even this extra-"ordinary rate of increase is probably short of the "utmost power of population," and "that it cannot be "doubted, that, in particular districts, the period of "doubling, from procreation only, has often been less "than fifteen years[1]." It would be a matter of great curiosity if this class of our writers on the subject of population, after favouring the public with what they conceive to be the maximum of that power, would proceed to demonstrate the possibility of their assertions, not by abstract reasonings upon the subject, or by some formula which would conceal from all but the practised mathematician every step of the process, and every thing, perhaps, excepting the fallacious result, from even him; but, in some such method as that adopted in this chapter, and which will be again more fully pursued, namely, by plain numerical calculations, open, step by step, to general examination, and obvious throughout to the test of human experience. To this species of proof, those who make or reiterate such

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[1] Malthus, Essay on Population, p. 339, note.

statements as the preceding ones, are challenged; in the mean time, their assertions, however bold and repeated, are unhesitatingly contradicted and denied.

(22) It is not a little singular with regard to these rapid periods of doubling, that the more judicious of the writers of the country, in which we are assured they have so frequently occurred as to leave no manner of doubt upon the subject, and occurred from procreation only, not only doubt, but deny the fact altogether; probably from an apprehension that any suppositions so grossly absurd would have the effect of bringing into deserved suspicion and contempt the more moderate term for which they themselves zealously contend, and which sufficiently satisfies the purposes of national vanity. Thus Dr. Seybert, alluding to the "philosophers of Europe," as he calls this class of writers, expressly says, that should any such facts as they have deemed possible be found in portions of newly formed states, "for the causes of such partial "increase, we must look to other sources than mere "procreation[1]." What other sources are there? emigrations only.

(23) Thus discredited and denied in the country where they are said to have occurred, and, what is of far greater importance to the argument, shewn to be absurd and impossible to the highest degree every where, shall we hear any more of these doublings in 10 years, in 12⅘ years, and in less than 15 years? Doubtlessly. The system I am combating cannot afford to forego them; it is made up of these and other suppositions equally extravagant, which are presented to the reader as incontrovertible facts, and it must stand or fall with them. Hence these ratios of human

[1] Seybert's Statistical Annals of the United States.

increase will continue to be reasserted, with as thorough a disregard of the plainest demonstrations of their impossibility, as, for instance, the paucity of population in the American Colonies in 1643, and its plethory in China at the present moment, which will still be maintained and appealed to, in contempt of all evidence, and even in defiance of official information to the contrary. Such is the effrontery of a system that cruelly asserts, in so many words of a numerous portion of the human race, "that they have no business to be where they are," and which blasphemously insinuates throughout, that the universal Parent is devoid either of the will or the power to provide for the unchecked numbers of his human offspring.

CHAPTER III.

OF THE POSSIBLE PERIODS OF HUMAN DUPLICATION, CONTINUED.

(1) THE next period of doubling that has to be examined, is that put forth by Dr. Franklin. The comparatively early period of his literary life in which it was written may apologize for the contradictions and absurdities it involves, even as explained by himself; and it would not therefore have been noticed here, but that it is adopted by our anti-populationists and advanced as one of their principal proofs, especially by the author so frequently alluded to, who repeatedly refers to Dr. Franklin as one of his main authorities[1].

(2) The following then are the terms in which the latter delivers himself on the subject. "Marriages "in America are more general, and more generally "early, than in Europe; and if it is reckoned there, "that there is but one marriage per annum among "100 persons, perhaps we may here reckon two; and "if in Europe they have but four births to a marriage, "(many of their marriages being late,) we may here "reckon eight; of which, if one half grow up, and "our marriages are made, one with another, at twenty "years of age, our people must at least be doubled "every twenty years[2]." Mr. Malthus, quoting that part of the sentence which refers to American prolificness, and that portion of it which survives to be married, adds, that it "is probably not far from the

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[1] Malthus, Essay, Pref. p. iv. p. 2. [2] Dr. Franklin, Works, vol. ii. p. 385. 8vo. 1806.

truth[1]." It is, however, as far from it as the antipodes; as all the records of American population, since obtained, have fully proved: but it required no precise observations to have been made, to have contradicted such extravagant suppositions; nature stamps falsehood upon them in characters too large and legible to be either overlooked or misunderstood.

(3) Every other part of the statement, including the deduction, is equally erroneous, and involves direct impossibilities. That referring to the proportion of American marriages, as well as similar ones repeated by the "philosophers of Europe," regarding the relative number of those which would take place here, were it not for the operation of the "prudential check," will be shewn, in a succeeding chapter, to be a set of as ungrounded assertions as ever abused public credulity.

(4) But if, in this celebrated problem of American increase so often appealed to, we admit the postulata, what still becomes of the demonstration? Granting the miracle in behalf of our American breeders, that they have doubled themselves, including even their surviving progenitors, at the very moment of their marriage, namely, at 20; we inquire whether all their prolific offspring are not to live 20 years, before, in turn, they marry, and then whether we are not to allow some time at least before they can add one half their own number to the existing population; and a far longer period, which must be still enlarged to allow for the infant mortality stated, before their number can be permanently doubled; nor is this all: surviving parents there must be of our prolific couples, marrying so early as 20, who, though totally forgotten in all these computations, it is hoped, in so favoured a com-

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[1] Malthus, Essay on Population, p. 260. Note.

munity as the one described, must be numerous, as they cannot be aged: these, then, must likewise to be doubled, demanding at least another surviving birth, and often more, before the duplication in question is completed, extending the period, according to the established and immutable laws of nature, to nearly half as long again as that "reckoned" on by Dr. Franklin, allowing him the full benefit of his own extravagant assumption in favour of the American population.

(5) Perhaps it may be thought that enough has been already advanced in disproof of the period of doubling contended for by Dr. Franklin; but being fully aware of the impression which such an authority leaves upon the public mind, and, likewise, of the obscurity which attends mere reasoning upon matters involving figures, which arithmetic alone can finally decide, I insert another table, calculated upon the precise data he has given, conforming them to those laws of nature which, on the average of her operations, are certain and immutable.

(6) These laws of nature, bearing upon the succeeding calculation, are the two following: First, married females do not become fruitful, on the average, during the first year of their nuptials, but nearly so. A great number of cases which I have collected, with a view of determining this point, give three-fourths of them as producing their first child at the average of one year after marriage. Second, the interval of time at which the fruitful couples produce their children, calculated from the period of their marriage to the birth of their last child, including the greater prolificness of the first year, exceeds two years. It extends to between 2¼ and 2½ years, if calculated from the first birth.

(7) The last of these facts must be impressed upon the mind and recollection of the reader, as all the tables

are constructed upon the presumption of its certainty, and, happily, it is one, which, on this very debatable question, has never been made the subject of controversy, and which does not admit of it. Nothing is more certain, or better ascertained, than the average period at which the human female, in a state of prolificness, reproduces. Were we, indeed, to form our general rules from particular exceptions, we should in this, as in all other cases, be grievously misled: we might conclude, for instance, that she would continue to multiply within the year; but general computations will rectify any such error, and conduct us to conclusions which are not only reconcileable with philosophy and truth, but resolvable into the ordinations of a merciful Providence. The human mother has to feed her infant for a period pretty nearly corresponding in length to that of gestation, (I speak now as it regards the necessity of the great mass of the community, with whom the question evidently rests;) nature, therefore, has kindly ordained, as a general rule, that the period of impregnation shall be postponed till that essential duty is discharged, and for a period somewhat beyond it; and he must be ignorant indeed who does not see most clearly that the health, and, indeed, frequently the existence, both of mother and offspring, are secured by this physical regulation of the common Parent of mankind. The human being, in reference to the term of existence, multiplies later, and at longer intervals, and ceases to be prolific sooner, than any other animated being with which we are acquainted; hence we find on the average, that, in the maternal state, during its period of fruitfulness, the births are not so frequent as once in two years. Even in the rank of society, which is absolved from the necessity (though not from the duty) of fulfilling one of the most important of the maternal offices, that of feeding, from their own bosoms, their infant offspring, and who too often avail themselves of that unnatural immunity, consequently, removing what our physiologists regard as one of the physical impediments to an accelerated prolificness,—even in this rank I find the births are at intervals of about, but rather exceeding two years; that period, therefore, as it respects the mass of the community, who are differently circumstanced in this respect, cannot be shorter. But arguments and proofs on this point are unnecessary, no writer having ever ventured upon supposing a shorter period than two years possible; and even Sir William Petty, when labouring to prove the possibility of a doubling every ten years for a century after the flood, amongst his other suppositions, so extravagant if applied to the present era, only lays it down, that "every teeming woman can bear a child once in two years[1]."

(8) In the preceding tables, therefore, as well as in those that are to follow, I have gone to the very verge of possibility in favour of population, by assigning the successive births at intervals of two years; I have gone beyond it, by invariably giving one to the year succeeding marriage. In the one that immediately follows, as Dr. Franklin only claims four out of eight children, as those who live to form marriages, and to renew the multiplication he contends for; commencing as I do with the first year, and giving to that year a surviving and a prolific birth, instead of alternately placing an unprolific one there, I am obviously affording two important advantages to Dr. Franklin's principle of increase beyond what he himself demands, the effect of which I am perfectly well aware of, as may any one who will put it to the proof, as I have done. But I

[1] Sir William Petty, Tracts, p. 105.

allow these advantages to the system which I oppose, advisedly; in order to remove the proofs I present beyond the range of cavil or contradiction. The unprolific births (by which term I constantly mean those children which do not survive to marry or become fruitful) are omitted, their proportion to the married and to the born being precisely the same throughout; their omission, therefore, can have no effect whatever on the ratio of increase, which is the sole object of our inquiry. Should there be any doubt, however, on this subject, the reader is referred to a subsequent Table, where they are supplied, for the purpose of pursuing inquiries of a different nature. I have only to add, that, excluding the unprolific births, 65 years is fixed upon, in the ensuing Table, as the average duration of life throughout.

TABLE XX.

SHEWING THE PROGRESS OF A POPULATION, IN WHICH THE MARRIAGES TAKE PLACE AT 20, AND ALL THE MARRIED HAVE 8 CHILDREN, 4 OF WHOM SURVIVE TO MARRY AT THE SAME AGE, AND BECOME EQUALLY PROLIFIC: THE INFANT AND UNPROLIFIC DEATHS OMITTED THROUGHOUT, AS HAVING NO EFFECT ON THE RATE OF INCREASE. THE MEAN DURATION OF LIFE BEING 65 YEARS, AND THE PROPORTION OF EFFETE POPULATION TO THE TWO COUPLES WITH WHICH THE TABLE COMMENCES, 3.

Years.	Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths.	Total Number in existence.
										3
1	2	..	..	..	..	..	.	..	..	7
2	..	2	..	..	..	2	22	2	..	9
3	..	..	..	..	..	..	.	2	..	9
4	..	..	..	..	..	..	.	2	1	8
5	..	..	..	..	..	..	.	2	..	8

Years.	Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths.	Total Number in existence.
6	..	2	..	..	..	2	26	4	..	10
7	..	..	..	..	..	..	.	4	..	10
8	..	..	..	..	..	..	.	4	..	10
9	..	..	..	..	..	..	.	4	..	10
10	..	2	..	..	..	2	30	6	..	12
11	..	..	..	..	..	..	.	6	..	12
12	..	..	..	..	..	..	.	6	..	12
13	..	..	..	..	..	..	.	6	..	12
14	..	2	..	..	..	2	34	8	..	14
15	..	..	..	..	..	..	.	8	..	14
16	..	..	..	..	..	..	.	8	..	14
17	..	..	..	..	..	..	.	8	..	14
18	..	..	..	..	..	..	.	8	..	14
19	..	..	..	..	..	..	.	8	..	14
20	..	..	..	..	..	..	.	8	..	14
21	..	..	..	..	..	..	.	8	..	14
22	1	..	..	..	..	..	.	8	..	14
23	..	1	..	..	..	1	48	9	..	15
24	..	..	..	..	..	..	.	9	2	13
25	..	..	..	..	..	..	.	9	..	13
26	1	..	..	..	..	..	.	9	..	13
27	..	1	1	..	..	2	47	11	..	15
28	..	..	..	..	..	..	.	11	..	15
29	..	..	..	..	..	..	.	11	..	15
30	1	..	..	..	..	..	.	11	..	15
31	..	1	1	1	..	3	51	14	..	18
32	..	..	..	..	..	..	.	14	..	18
33	..	..	..	..	..	..	.	14	..	18
34	1	..	..	..	..	..	.	14	..	18

Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths.	Total Number in existence.
..	1	1	1	1	4	55	18	..	22
..	..	..	..	..	..	.	18	..	22
..	..	..	..	..	..	.	18	..	22
..	..	..	..	..	..	.	18	..	22
..	..	1	1	1	3	59	21	..	25
..	..	..	..	..	..	.	21	..	25
..	..	..	..	..	..	.	21	..	25
..	..	..	..	..	..	.	21	..	25
½	..	..	1	1	2	63	23	..	27
..	½	..	..	..	½	64	23½	..	27½
..	..	..	..	..	..	.	23½	4	23½
..	..	..	..	..	..	.	23½	..	23½
1	..	..	..	1	1	67	24½	..	24½
..	½	1	..	..	1½	68	26	..	26
..	..	..	..	..	..	.	26	..	26
..	..	..	..	..	..	.	26	..	26
1½	..	..	..	..	..	.	26	..	26
..	½	1	1½	..	3	72	29	..	29
..	..	..	..	..	..	.	29	..	29
..	..	..	..	..	..	.	29	..	29
2	..	..	..	..	..	.	29	..	29
..	½	1	1½	2	5	76	34	..	34
..	..	..	..	..	..	.	34	..	34
..	..	..	..	..	..	.	34	..	34
1½	..	..	..	..	..	.	34	..	34
..	1½	1	1½	2	6	80	40	..	40
..	..	..	..	..	..	.	40	..	40
..	..	..	..	..	..	.	40	..	40
1	..	..	..	..	..	.	40	..	40

Years.	Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths of such.	
64	¼	1½	1	1½	2	6	84	46	..	4
65	..	¼	..	..	..	¼	85	46¼	..	4
66	..	..	..	..	..	..	.	46¼	..	4
67	½	..	..	..	..	..	.	46¼	2	4
68	¾	1½	1	½	2	5	88	51¼	..	4
69	..	¼	¾	..	..	1	89	52¼	..	5
70	..	..	..	..	..	..	.	52¼	..	5
71	..	..	..	..	..	..	.	52¼	2	4
72	1½	1½	1	½	..	3	92	55¼	..	5
73	..	¼	¾	1½	..	2½	93	57¾	..	5
74	..	..	..	..	..	..	.	57¾	..	5
75	..	..	..	..	..	..	.	57¾	2	5
76	2½	..	1	½	..	1½	96	59¼	..	5
77	..	¼	¾	1½	2½	5	97	64¼	..	5
78	..	..	..	..	..	..	.	64¼	..	5
79	..	..	..	..	..	..	.	64¼	2	5
80	3	..	..	½	..	½	100	64¾	..	5
81	..	3	¾	1½	2½	7¾	101	72½	..	6
82	..	..	..	..	..	..	.	72½	..	6
83	..	..	..	..	..	..	.	72½	..	6
84	3	..	..	..	..	..	.	72½	..	6
85	⅛	3	3	1½	2½	10	105	82½	..	7
86	..	⅛	..	..	..	⅛	106	82⅝	..	7
87	..	..	..	..	..	..	.	82⅝	..	7
88	2½	..	..	..	..	..	.	82⅝	1	7
89	½	3	3	2½	2½	11	109	93⅝	..	8
90	..	⅛	⅛	..	..	⅝	110	94¼	..	8
91	..	..	..	..	..	..	.	94¼	..	8
92	1½	..	..	..	..	..	.	94¼	2	8

Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths of such.	Total Number in existence.
$1\frac{1}{4}$	3	3	$2\frac{1}{2}$	$1\frac{1}{2}$	10	113	$104\frac{1}{4}$	..	$93\frac{1}{4}$
..	$\frac{1}{8}$	$\frac{1}{2}$	$1\frac{1}{4}$	..	$1\frac{7}{8}$	114	$106\frac{1}{8}$	..	$95\frac{1}{8}$
..	..	..	..	..	..	.	$106\frac{1}{8}$	..	$95\frac{1}{8}$
$\frac{3}{4}$	..	..	..	..	..	.	$106\frac{1}{8}$	3	$92\frac{1}{8}$
$2\frac{1}{2}$	$\frac{3}{4}$	3	$2\frac{1}{2}$	$1\frac{1}{2}$	$7\frac{3}{4}$	117	$113\frac{7}{8}$	..	$99\frac{7}{8}$
..	$\frac{1}{8}$	$\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$4\frac{3}{8}$	118	$118\frac{1}{4}$	..	$104\frac{1}{4}$
..	..	..	..	..	..	.	$118\frac{1}{4}$	..	$104\frac{1}{4}$
$\frac{1}{4}$	..	..	..	..	..	.	$118\frac{1}{4}$	4	$100\frac{1}{4}$
$3\frac{7}{8}$	$\frac{3}{4}$	$\frac{1}{4}$	$2\frac{1}{2}$	$1\frac{1}{2}$	5	121	$123\frac{1}{4}$	..	$105\frac{1}{4}$
..	$3\frac{7}{8}$	$\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$8\frac{1}{9}$	122	$131\frac{3}{8}$	..	$113\frac{3}{8}$
..	..	..	..	..	..	.	$131\frac{3}{8}$	..	$113\frac{3}{8}$
..	..	..	..	..	..	.	$131\frac{3}{8}$	3	$110\frac{3}{8}$
5	$\frac{3}{4}$	$\frac{1}{4}$	..	$1\frac{1}{2}$	$2\frac{1}{2}$	125	$133\frac{7}{8}$	..	$112\frac{7}{8}$
$\frac{1}{16}$	$3\frac{7}{8}$	5	$1\frac{1}{4}$	$2\frac{1}{2}$	$12\frac{5}{8}$	126	$146\frac{1}{2}$	..	$125\frac{1}{2}$
..	$\frac{1}{16}$	..	..	..	$\frac{1}{16}$	127	$146\frac{9}{16}$	..	$125\frac{9}{16}$
..	..	..	..	..	..	.	$146\frac{9}{16}$	2	$123\frac{9}{16}$
$5\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{4}$	..	..	1	129	$147\frac{9}{16}$	$\frac{1}{2}$	$124\frac{1}{16}$
$\frac{5}{16}$	$3\frac{7}{8}$	5	$5\frac{1}{2}$	$2\frac{1}{2}$	$16\frac{7}{8}$	130	$164\frac{7}{16}$	..	$140\frac{15}{16}$
..	$\frac{1}{16}$	$\frac{5}{16}$	..	..	$\frac{3}{8}$	131	$164\frac{13}{16}$	..	$141\frac{5}{16}$
..	..	..	..	..	..	.	$164\frac{13}{16}$	1	$140\frac{5}{16}$
5	..	$\frac{1}{4}$	..	..	$\frac{1}{4}$	133	$165\frac{1}{16}$	$1\frac{1}{2}$	$139\frac{1}{16}$
$\frac{15}{16}$	$3\frac{7}{8}$	5	$5\frac{1}{2}$	5	$19\frac{3}{8}$	134	$184\frac{7}{16}$	..	$158\frac{7}{16}$
..	$\frac{1}{16}$	$\frac{5}{16}$	$\frac{15}{16}$	..	$1\frac{5}{16}$	135	$185\frac{3}{4}$	..	$159\frac{3}{4}$
..	..	..	..	..	..	.	$185\frac{3}{4}$	..	$159\frac{3}{4}$
$3\frac{7}{8}$	..	..	..	..	..	.	$185\frac{3}{4}$	3	$156\frac{3}{4}$
$2\frac{3}{16}$	$3\frac{7}{8}$	5	$5\frac{1}{2}$	5	$19\frac{3}{8}$	138	$205\frac{1}{8}$	..	$176\frac{1}{8}$
..	$\frac{1}{16}$	$\frac{5}{16}$	$\frac{15}{16}$	$2\frac{3}{16}$	$3\frac{1}{2}$	139	$208\frac{5}{8}$	..	$179\frac{5}{8}$
..	..	..	..	..	..	.	$208\frac{5}{8}$	..	$179\frac{5}{8}$
$2\frac{1}{2}$	..	..	..	..	..	.	$208\frac{5}{8}$	5	$174\frac{5}{8}$

Year.	Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths of such.	T Num
122	$4\frac{1}{16}$	$3\frac{7}{8}$	$2\frac{1}{2}$	$5\frac{1}{2}$	5	$16\frac{7}{8}$	142	$225\frac{1}{2}$	..	191
123	..	$4\frac{1}{16}$	$\frac{5}{16}$	$\frac{15}{16}$	$2\frac{3}{16}$	$7\frac{1}{2}$	143	233	..	19
124	..	..	..	..	..	..	.	233	.	19
125	$1\frac{1}{4}$	..	..	..	..	..	.	233	6	19
126	$6\frac{5}{16}$	$3\frac{7}{8}$	$2\frac{1}{2}$	$1\frac{1}{4}$	5	$12\frac{5}{8}$	146	$245\frac{5}{8}$	..	20
127	$\frac{1}{32}$	$4\frac{1}{16}$	$6\frac{5}{16}$	$\frac{15}{16}$	$2\frac{3}{16}$	$13\frac{1}{2}$	147	$259\frac{1}{8}$	..	21
128	..	$\frac{1}{32}$	..	..	..	$\frac{1}{32}$	148	$259\frac{5}{32}$	..	21
129	$\frac{1}{2}$	..	..	..	..	..	.	$259\frac{5}{32}$	6	21
130	$8\frac{7}{16}$	$3\frac{7}{8}$	$2\frac{1}{2}$	$1\frac{1}{4}$	$\frac{1}{2}$	$8\frac{1}{8}$	150	$267\frac{9}{32}$	$\frac{1}{4}$	22
131	$\frac{3}{16}$	$4\frac{1}{16}$	$6\frac{5}{16}$	$8\frac{7}{16}$	$2\frac{3}{16}$	21	151	$288\frac{9}{32}$	..	24
132	..	$\frac{1}{32}$	$\frac{3}{16}$	..	..	$\frac{7}{32}$	152	$288\frac{1}{2}$	..	24
133	$\frac{1}{8}$	..	..	..	..	..	.	$288\frac{1}{2}$	5	23
134	$9\frac{11}{16}$	$\frac{1}{8}$	$2\frac{1}{2}$	$1\frac{1}{4}$	$\frac{1}{2}$	$4\frac{3}{8}$	154	$292\frac{7}{8}$	1	24
135	$\frac{21}{32}$	$4\frac{1}{16}$	$6\frac{5}{16}$	$8\frac{7}{16}$	$9\frac{11}{16}$	$28\frac{1}{2}$	155	$321\frac{3}{8}$	..	26
136	..	$\frac{1}{32}$	$\frac{3}{16}$	$\frac{21}{32}$	..	$\frac{7}{8}$	156	$322\frac{1}{4}$	..	27
137	..	..	..	..	..	..	.	$322\frac{1}{4}$	3	26
138	$9\frac{11}{16}$	$\frac{1}{8}$	..	$1\frac{1}{4}$	$\frac{1}{2}$	$1\frac{7}{8}$	158	$324\frac{1}{8}$	$2\frac{1}{2}$	26
139	$1\frac{3}{4}$	$9\frac{11}{16}$	$6\frac{5}{16}$	$8\frac{7}{16}$	$9\frac{11}{16}$	$34\frac{1}{8}$	159	$358\frac{1}{4}$	..	30
140	..	$\frac{1}{32}$	$\frac{3}{16}$	$\frac{21}{32}$	$1\frac{3}{4}$	$2\frac{5}{8}$	160	$360\frac{7}{8}$	..	30
141	..	..	..	..	..	..	.	$360\frac{7}{8}$	$1\frac{1}{2}$	30
142	$8\frac{7}{16}$	$\frac{1}{8}$	..	..	$\frac{1}{2}$	$\frac{5}{8}$	162	$361\frac{1}{2}$	5	29
143	$3\frac{3}{4}$	$9\frac{11}{16}$	$8\frac{7}{16}$	$8\frac{7}{16}$	$9\frac{11}{16}$	$36\frac{1}{4}$	163	$397\frac{3}{4}$	..	33
144	..	$3\frac{3}{4}$	$\frac{3}{16}$	$\frac{21}{32}$	$1\frac{3}{4}$	$6\frac{11}{32}$	164	$404\frac{3}{32}$	..	33
145	..	..	..	..	..	..	.	$404\frac{3}{32}$	$\frac{1}{2}$	33
146	$6\frac{5}{16}$	$\frac{1}{8}$	..	..	..	$\frac{1}{8}$	166	$404\frac{7}{32}$	$7\frac{3}{4}$	33
147	$6\frac{3}{4}$	$9\frac{11}{16}$	$8\frac{7}{16}$	$6\frac{5}{16}$	$9\frac{11}{16}$	$34\frac{1}{8}$	167	$438\frac{11}{32}$	..	36
148	$\frac{1}{64}$	$3\frac{3}{4}$	$6\frac{3}{4}$	$\frac{21}{32}$	$1\frac{3}{4}$	$12\frac{29}{32}$	168	$451\frac{1}{4}$	..	37
149	..	$\frac{1}{64}$	..	..	..	$\frac{1}{64}$	169	$451\frac{17}{64}$	..	37
150	$4\frac{1}{16}$	..	..	..	..	..	.	$451\frac{17}{64}$	10	36

Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths of such.	Total Number in existence.
$10\frac{1}{2}$	$9\frac{11}{16}$	$8\frac{7}{16}$	$6\frac{5}{16}$	$4\frac{1}{16}$	$28\frac{1}{2}$	171	$479\frac{49}{64}$	$\frac{1}{8}$	$397\frac{9}{64}$
$\frac{1}{64}$	$3\frac{3}{4}$	$6\frac{3}{4}$	$10\frac{1}{2}$	$1\frac{3}{4}$	$22\frac{3}{4}$	172	$502\frac{33}{64}$	..	$419\frac{57}{64}$
..	$\frac{1}{64}$	$\frac{7}{64}$	..	..	$\frac{1}{8}$	173	$502\frac{41}{64}$	..	$420\frac{1}{64}$
$2\frac{1}{16}$	..	..	..	..	..	.	$502\frac{41}{64}$	11	$409\frac{1}{64}$
$14\frac{1}{4}$	$2\frac{3}{16}$	$8\frac{7}{16}$	$6\frac{5}{16}$	$4\frac{1}{16}$	21	175	$523\frac{41}{64}$	$\frac{5}{8}$	$429\frac{25}{64}$
$\frac{1}{16}$	$3\frac{3}{4}$	$6\frac{3}{4}$	$10\frac{1}{2}$	$14\frac{1}{4}$	$35\frac{1}{4}$	176	$558\frac{57}{64}$	..	$464\frac{41}{64}$
..	$\frac{1}{64}$	$\frac{7}{64}$	$\frac{7}{16}$	..	$\frac{9}{16}$	177	$559\frac{29}{64}$	..	$465\frac{13}{64}$
$\frac{15}{16}$	..	..	..	..	..	.	$559\frac{29}{64}$	10	$455\frac{13}{64}$
$17\frac{1}{16}$	$2\frac{3}{16}$	$\frac{15}{16}$	$6\frac{5}{16}$	$4\frac{1}{16}$	$13\frac{1}{2}$	179	$572\frac{61}{64}$	$1\frac{7}{8}$	$466\frac{53}{64}$
$1\frac{5}{16}$	$17\frac{1}{16}$	$6\frac{3}{4}$	$10\frac{1}{2}$	$14\frac{1}{4}$	$48\frac{9}{16}$	180	$621\frac{33}{64}$	..	$515\frac{25}{64}$
..	$\frac{1}{64}$	$\frac{7}{64}$	$\frac{7}{16}$	$1\frac{5}{16}$	$1\frac{7}{8}$	181	$623\frac{25}{64}$	..	$517\frac{17}{64}$
$\frac{5}{16}$	..	..	..	..	..	.	$623\frac{25}{64}$	$7\frac{3}{4}$	$509\frac{33}{64}$
$18\frac{1}{8}$	$2\frac{3}{16}$	$\frac{15}{16}$	$\frac{5}{16}$	$4\frac{1}{16}$	$7\frac{1}{2}$	183	$630\frac{57}{64}$	$4\frac{3}{8}$	$512\frac{41}{64}$
$3\frac{11}{64}$	$17\frac{1}{16}$	$18\frac{1}{8}$	$10\frac{1}{2}$	$14\frac{1}{4}$	$59\frac{15}{16}$	184	$690\frac{53}{64}$	..	$572\frac{37}{64}$
..	$3\frac{19}{64}$	$\frac{7}{64}$	$\frac{7}{16}$	$1\frac{5}{16}$	$5\frac{5}{32}$	185	$695\frac{55}{64}$	..	$577\frac{39}{64}$
$\frac{1}{16}$	..	..	..	..	..	.	$695\frac{55}{64}$	5	$572\frac{39}{64}$
$17\frac{1}{16}$	$2\frac{3}{16}$	$\frac{15}{16}$	$\frac{5}{16}$	$\frac{1}{16}$	$3\frac{1}{2}$	187	$699\frac{23}{64}$	$8\frac{1}{8}$	$567\frac{63}{64}$
$6\frac{29}{64}$	$17\frac{1}{16}$	$18\frac{1}{8}$	$17\frac{1}{16}$	$14\frac{1}{4}$	$66\frac{1}{2}$	188	$765\frac{55}{64}$	..	$634\frac{31}{64}$
$\frac{1}{128}$	$3\frac{11}{64}$	$6\frac{29}{64}$	$\frac{7}{16}$	$1\frac{5}{16}$	$11\frac{3}{8}$	189	$777\frac{15}{64}$	..	$645\frac{55}{64}$
..	$\frac{1}{128}$	..	..	..	$\frac{1}{128}$	.	$777\frac{31}{128}$	$2\frac{1}{2}$	$643\frac{47}{128}$
$14\frac{1}{2}$	..	$\frac{15}{16}$	$\frac{5}{16}$	$\frac{1}{16}$	$1\frac{5}{16}$	191	$778\frac{71}{128}$	$12\frac{5}{8}$	$632\frac{7}{128}$
$11\frac{3}{8}$	$17\frac{1}{16}$	$18\frac{1}{8}$	$17\frac{1}{16}$	$14\frac{1}{4}$	$66\frac{1}{2}$	192	$845\frac{7}{128}$	$\frac{1}{16}$	$698\frac{63}{128}$
$\frac{1}{16}$	$3\frac{11}{64}$	$6\frac{29}{64}$	$11\frac{3}{8}$	$1\frac{5}{16}$	$22\frac{5}{16}$	193	$867\frac{47}{128}$	..	$720\frac{103}{128}$
..	$\frac{1}{128}$	$\frac{1}{16}$	..	..	$\frac{9}{128}$	194	$867\frac{7}{16}$	1	$719\frac{7}{8}$
$10\frac{1}{2}$	..	..	$\frac{5}{16}$	$\frac{1}{16}$	$\frac{3}{8}$	195	$867\frac{13}{16}$	$16\frac{7}{8}$	$703\frac{3}{8}$
$17\frac{5}{8}$	$10\frac{1}{2}$	$18\frac{1}{8}$	$17\frac{1}{16}$	$14\frac{1}{4}$	$59\frac{15}{16}$	196	$927\frac{3}{4}$	$\frac{3}{8}$	$762\frac{15}{16}$
$\frac{9}{32}$	$3\frac{11}{64}$	$6\frac{29}{64}$	$11\frac{3}{8}$	$17\frac{5}{8}$	$38\frac{5}{8}$	197	$966\frac{3}{8}$	..	$801\frac{9}{16}$
..	$\frac{1}{128}$	$\frac{1}{16}$	$\frac{9}{32}$	..	$\frac{45}{128}$	198	$966\frac{93}{128}$	$\frac{1}{4}$	$801\frac{85}{128}$
$6\frac{3}{4}$	..	..	..	$\frac{1}{16}$	$\frac{1}{16}$	199	$966\frac{101}{128}$	$19\frac{3}{8}$	$782\frac{45}{128}$
$24\frac{9}{32}$	$10\frac{1}{2}$	$6\frac{3}{4}$	$17\frac{1}{16}$	$14\frac{1}{4}$	$48\frac{9}{16}$	200	$1015\frac{45}{128}$	$1\frac{5}{16}$	$829\frac{77}{128}$

Year.	Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths of such.	Total Number in existence.
181	$\frac{15}{16}$	$24\frac{9}{32}$	$6\frac{29}{64}$	$11\frac{3}{8}$	$17\frac{5}{8}$	$59\frac{47}{64}$	201	$1075\frac{11}{128}$	..	$889\frac{43}{128}$
182	..	$\frac{1}{128}$	$\frac{1}{16}$	$\frac{9}{32}$	$\frac{15}{16}$	$1\frac{37}{128}$	202	$1076\frac{3}{8}$	..	$890\frac{5}{8}$
183	$3\frac{3}{4}$	..	..	..	..	..	.	$1076\frac{3}{8}$	$19\frac{3}{8}$	$871\frac{1}{4}$
184	$29\frac{31}{32}$	$10\frac{1}{2}$	$3\frac{3}{4}$	$6\frac{3}{4}$	$14\frac{1}{4}$	$35\frac{1}{4}$	204	$1111\frac{5}{8}$	$3\frac{1}{2}$	903
185	$2\frac{33}{64}$	$24\frac{9}{32}$	$29\frac{31}{32}$	$11\frac{3}{8}$	$17\frac{5}{8}$	$83\frac{1}{4}$	205	$1194\frac{7}{8}$	..	$986\frac{1}{4}$
186	..	$2\frac{33}{64}$	$\frac{1}{16}$	$\frac{9}{32}$	$\frac{15}{16}$	$3\frac{51}{64}$	206	$1198\frac{43}{64}$	..	$990\frac{3}{64}$
187	$1\frac{3}{4}$	..	..	..	..	..	.	$1198\frac{43}{64}$	$16\frac{7}{8}$	$973\frac{11}{64}$
188	$83\frac{1}{4}$	$10\frac{1}{2}$	$3\frac{3}{4}$	$6\frac{3}{4}$	$1\frac{3}{4}$	$22\frac{3}{4}$	.	$1221\frac{27}{64}$	$7\frac{1}{2}$	$988\frac{27}{64}$
189	$5\frac{11}{16}$	$24\frac{9}{32}$	$29\frac{31}{32}$	$33\frac{1}{4}$	$17\frac{5}{8}$	$105\frac{1}{8}$	.	$1326\frac{35}{64}$	..	$1003\frac{35}{64}$
190	$\frac{1}{256}$	$2\frac{33}{64}$	$5\frac{11}{16}$	$\frac{9}{32}$	$\frac{15}{16}$	$9\frac{27}{64}$	.	$1335\frac{31}{32}$	..	$1102\frac{31}{32}$
191	$\frac{21}{32}$	$\frac{1}{256}$	..	..	..	$\frac{1}{256}$	.	$1335\frac{249}{256}$	$12\frac{5}{8}$	$1090\frac{89}{256}$
192	$33\frac{1}{4}$	$\frac{21}{32}$	$3\frac{3}{4}$	$6\frac{3}{4}$	$1\frac{3}{4}$	$12\frac{29}{32}$	.	$1348\frac{225}{256}$	$13\frac{1}{2}$	$1089\frac{193}{256}$
193	$11\frac{5}{32}$	$24\frac{9}{32}$	$29\frac{31}{32}$	$33\frac{1}{4}$	$33\frac{1}{4}$	$120\frac{3}{4}$	.	$1469\frac{161}{256}$	$\frac{1}{32}$	$1210\frac{121}{256}$
194	$\frac{9}{256}$	$2\frac{33}{64}$	$5\frac{11}{16}$	$11\frac{5}{32}$	$\frac{15}{16}$	$20\frac{19}{64}$	.	$1489\frac{237}{256}$	..	$1230\frac{197}{256}$
195	$\frac{3}{16}$	$\frac{1}{256}$	$\frac{9}{256}$	..	..	$\frac{5}{128}$	.	$1489\frac{247}{256}$	$8\frac{1}{8}$	$1222\frac{175}{256}$
196	$29\frac{31}{32}$	$\frac{21}{32}$	$3\frac{3}{4}$	$\frac{3}{16}$	$1\frac{3}{4}$	$6\frac{11}{32}$	.	$1496\frac{79}{256}$	21	$1208\frac{7}{256}$
197	$19\frac{5}{16}$	$29\frac{31}{32}$	$29\frac{31}{32}$	$33\frac{1}{4}$	$33\frac{1}{4}$	$126\frac{7}{16}$	.	$1622\frac{191}{256}$	$\frac{7}{32}$	$1334\frac{63}{256}$
198	$\frac{45}{256}$	$2\frac{33}{64}$	$5\frac{11}{16}$	$11\frac{5}{32}$	$19\frac{5}{16}$	$38\frac{43}{64}$	.	$1661\frac{107}{256}$	..	$1372\frac{235}{256}$
199	$\frac{1}{32}$	$\frac{1}{256}$	$\frac{9}{256}$	$\frac{45}{256}$	..	$\frac{55}{256}$	.	$1661\frac{81}{128}$	$4\frac{3}{8}$	$1368\frac{97}{128}$
200	$24\frac{9}{32}$	$\frac{21}{32}$	$\frac{1}{32}$	$\frac{3}{16}$	$1\frac{3}{4}$	$2\frac{5}{8}$	.	$1664\frac{33}{128}$	$28\frac{1}{2}$	$1342\frac{113}{128}$
201	$29\frac{111}{128}$	$29\frac{31}{32}$	$24\frac{9}{32}$	$33\frac{1}{4}$	$33\frac{1}{4}$	$120\frac{3}{4}$	.	$1785\frac{1}{128}$	$\frac{7}{8}$	$1462\frac{97}{128}$
202	$\frac{165}{256}$	$29\frac{111}{128}$	$5\frac{11}{16}$	$11\frac{5}{32}$	$19\frac{5}{16}$	$66\frac{3}{128}$	.	$1851\frac{1}{32}$	..	$1528\frac{25}{32}$
203	..	$\frac{1}{256}$	$\frac{9}{256}$	$\frac{45}{256}$	$\frac{165}{256}$	$\frac{55}{64}$	.	$1851\frac{57}{64}$	$1\frac{7}{8}$	$1527\frac{49}{64}$
204	$17\frac{5}{8}$	$\frac{21}{32}$	$\frac{1}{32}$	$\frac{3}{16}$	..	$\frac{7}{8}$	.	$1852\frac{49}{64}$	$34\frac{1}{8}$	$1494\frac{33}{64}$
205	$41\frac{5}{8}$	$29\frac{31}{32}$	$24\frac{9}{32}$	$17\frac{5}{8}$	$33\frac{1}{4}$	$105\frac{1}{8}$	.	$1957\frac{57}{64}$	$2\frac{5}{8}$	$1597\frac{1}{64}$
206	$1\frac{115}{128}$	$29\frac{111}{128}$	$41\frac{5}{8}$	$11\frac{5}{32}$	$19\frac{5}{16}$	$101\frac{123}{128}$	.	$2059\frac{109}{128}$	..	$1698\frac{125}{128}$
207	..	$1\frac{115}{128}$	$\frac{9}{256}$	$\frac{45}{256}$	$\frac{165}{256}$	$2\frac{193}{256}$	.	$2062\frac{155}{256}$	$\frac{5}{8}$	$1701\frac{27}{256}$
208	..	..	$\frac{1}{32}$	$\frac{3}{16}$	..	$\frac{7}{32}$	.	$2062\frac{211}{256}$	$36\frac{1}{4}$	$1665\frac{19}{256}$
Totals	$601\frac{41}{128}$					$2062\frac{211}{256}$			$404\frac{7}{8}$	$1665\frac{19}{256}$

PROOF.

Year.	Annual Marriages.	Surviving productive Births to each Marriage.				Annual Number of such Births.	Years when such Marry.	Total Number of such Births.	Annual No. of the Deaths of such.	Total Number in existence.
									$404\frac{3}{4}$	$1665\frac{19}{256}$
209	..	$29\frac{31}{32}$	$24\frac{9}{32}$	$17\frac{5}{8}$	..	$71\frac{7}{8}$				
210	..	$29\frac{111}{128}$	$41\frac{5}{8}$	..	$19\frac{5}{16}$	$90\frac{103}{128}$				
211	..	$1\frac{115}{128}$	..	$\frac{45}{256}$	$\frac{165}{256}$	$2\frac{23}{32}$				
212	..	..	$\frac{1}{32}$	..	..	$\frac{1}{32}$				
213	..	..	$24\frac{9}{32}$	$17\frac{5}{8}$	..	$41\frac{29}{32}$	.	Deduct the 7, existing in year 1, not included in the births.	7	
214	..	$29\frac{111}{128}$	$41\frac{5}{8}$	..	..	$71\frac{63}{128}$	.			
215	..	$1\frac{115}{128}$	..	..	$\frac{165}{256}$	$2\frac{139}{256}$				
216	..	..	..	..	..	..				
217	..	..	..	$17\frac{5}{8}$	..	$17\frac{5}{8}$	.	Remaining deaths to 208 being the No. of births to 143.	$397\frac{3}{4}$	$397\frac{3}{4}$
218	..	..	$41\frac{5}{8}$	..	..	$41\frac{5}{8}$	.			
219	..	$1\frac{115}{128}$	..	..	..	$1\frac{115}{128}$	.			
						$342\frac{133}{256}$		Births due after 208.		$342\frac{133}{256}$
PROOF $601\frac{43}{128}$		×	4	=		$2405\frac{11}{32}$				$2405\frac{11}{32}$

(7) Before the results of this table are applied to the determination of the argument; as it is constructed on a principle similar to the former ones[1], and includes every part of the calculation throughout, it may serve the purpose of explaining and illustrating the others, where certain of the particulars are omitted on account of the room their insertion would have occupied. The duration of life in the prolific, being assumed as 65 years, it follows, according to the fecundity prescribed to these, namely, 4 fruitful and surviving births to each marriage, that the surviving progenitors

[1] TABLES XVI. and XIX.

of the first two pairs with which the table commences, would be 3; one of whom would die in the year 4, and the remaining 2 in the year 24; the first couples being 20 years old at their marriage in the year 1, would die in the year 45, and the rest, 65 years after their births. But to explain the columns separately: the 1st gives the years of the table, the 2nd the marriages, entered, of course in the years in which they occur; the 3rd, 4th, 5th, and 6th, the surviving and prolific births, belonging to each marriage, in the proportion, and arranged in the intervals already stated; the 7th, the annual sum of these births; in the 8th, the year is registered when these births will themselves marry, and half their number (as it takes two individuals to form one marriage) are, at that time, regularly transferred to the 2nd column, that of the marriages, when they, in like manner, become equally prolific, and their offspring similarly recorded; the 9th gives the total number of births, from which number, the deaths entered in the 10th being deducted, the remainder, of course, expresses the number of that part of the surviving population on which the increase of the whole solely depends, and which shews the ratio of that increase, as exactly as though the infant deaths and unproductive births, which would bear an exact proportion to the whole throughout, had been included. This total is given in the 11th and last column, and is, of course, augmented for some of the first years after the table commences, by including the effete population then in existence, the necessary proportion of which is added; these, however, disappear at early periods of the term, whence, to its termination, the numbers in being become exclusively regulated by the recorded marriages, births, and deaths. The table has, therefore, all the regularity of a parish register, without any of the error or suspicion to which the latter is so liable; and supposing that the sums are correct, the demonstration it affords is irresistible, and that they are so, admits of a very plain and easy proof.

(8) This proof, as well as the principle on which the tables are constructed, is so exceedingly plain and obvious, that it almost seems degrading, both to myself and the reader, still further to dwell upon such particulars. But however mechanical the labour may be deemed, it is high time to clear away, at once and for ever, the ridiculous suppositions and impossible assumptions which have so long obscured, and indeed buried the truth, as it regards this momentous question. I shall, therefore, proceed to shew that the arithmetic of the preceding table is right. The births, to the year 187 are 1198$\frac{43}{64}$, producing, to the year 207, half their number of marriages, or 599$\frac{43}{128}$, which includes the whole that can be prolific within the entire period; to these must of course be added two for the first couples not included amongst the births, making 601$\frac{43}{128}$, which, multiplied by four, the proportion of surviving prolific children assigned by Dr. Franklin to each of his weddings, make 2405$\frac{11}{32}$: now, if to 2062$\frac{211}{256}$, the sum of the births found at the end of the table in 208, be added those which are still due from those last marriages in it, which have not completed their full quota of prolificness at its termination, amounting, as is shewn in the proof appended, to 342$\frac{133}{256}$, the total, 2405$\frac{11}{32}$, is exactly obtained; and if, to the existing population in 208, given as 1665$\frac{11}{256}$, be added the sum of the deaths during the entire period, which amount to 397$\frac{3}{4}$, their sum is that of the births in the same term, viz. 2062$\frac{211}{256}$: lastly, that this deduction is also right, is plain from its being the amount of the births to the year 143, or 65 years be-

fore, the term assumed as the duration of life throughout. The correctness of every part of the calculation, to the least fraction, is therefore substantiated.

(9) Before applying this table to the purpose contemplated in its construction, I shall repeat, that though the proportions assigned by Dr. Franklin, which are certainly extravagant enough, are taken, still they are so applied as to exceed, and indeed violate the law of Nature, as well as that of probability, in favour of population. This is remarked, in order to prevent the cursory reader from falling into a contrary apprehension, when he is made aware of the results. That the interval of prolificness is somewhat too short, I am perfectly persuaded; but, not to dwell upon that circumstance, it will not be denied that in admitting the first year after marriage as constantly prolific, I give an unnatural advantage to the scheme of multiplication put forth, and a far greater and more unreasonable one in making that year invariably produce a surviving and prolific birth, instead of giving it alternately to that and the 16th year after marriage; which, as half the births in Dr. Franklin's scheme do not survive to marry, the plainest rule of the doctrine of chances certainly demands. How influential this clearly necessary rectification would be on the increase manifested in the table needs not to be pointed out; the calculation would certainly have been so constructed, but its importance was not sufficiently adverted to until after the table was finished: the error on the side of excess can now only be remedied by deducting no inconsiderable proportion of the increase from the numbers generated by the somewhat erroneous mode of computation already explained. To all these instances, in proof that every disadvantage is voluntarily encountered in rebutting the possibility of

the period of doubling, now under examination, must be added the fact, that I shall assume twenty years as that term, whereas Dr. Franklin contends for its being less " than twenty."

(10) But all these rectifications will appear minute, and wholly unnecessary, when the plain facts, though thus somewhat overrated, are confronted with Dr. Franklin's hypothesis. Using then this table as the foregoing ones, let us commence at the period when the first couples have produced half their children, namely, in the year 6; from thence to its termination there are ten of these periods of duplication, of 20 years each, bringing us down to the year 206. Now the ten individuals found in the former year, six, ten times doubled, amount to 10,240, which we are assured would be produced in considerably less than that time. Our population, however, in the table, though all marrying at 20, and all the married having four children, which themselves survive, to marry and become equally fruitful, (leaving out such who die in infancy and unmarried, at both extremities of the table, and throughout, as totally uninfluential on the relative numbers,) surviving to the age of 65 years each, has advanced to 1665$\frac{19}{256}$ only, not one-sixth part of the augmentation required. If we proceed to the next period, in which the primary population is augmented, the 10th year, the 12 individuals then found, doubled nine times, for the table admits in this instance of no further term, come to 6144, which, on the hypothesis under examination, ought to be found in the year 192; instead of which, 1089$\frac{107}{256}$ would be the relative number in actual existence. From the year 14, the geometrical number would, in 194, be 7168, —the actual one is 1208$\frac{27}{56}$. Even were we to commence with the year 1, at the moment of the marriage

of our first couples, 10 doublings of the then existing individuals would give 7168, whereas in 201, there are 1462$\frac{21}{128}$ only. Nay, were we to proceed upon the principle of our modern writers upon population, and, rejecting all others, calculate from the breeders only at the beginning of the term, and triple their numbers at the end of it, by then admitting age and infancy into the reckoning, still Dr. Franklin's "reckoning," even allowing its basis to be borne out by facts, would be false in the proportion of 4096 to 1462$\frac{21}{128}$.

(11) But it is unnecessary to pursue the examination any further; I shall, however, remark, in conclusion, that the facts on which he erects his supposition about American doubling, are as palpably erroneous as the calculation he founds upon them. The assertion, that marriages take place there, on the average,' at 20, is hardly credible; that they produce eight children each, one with another, not at all so; while the statement that one marriage takes place annually, in every fifty persons, is, as will be seen, palpably impossible. In short, his calculations on this subject are far wilder than those developed in his codicil, in which he bequeaths, at a given period, upwards of four millions sterling to the inhabitants of Boston and the State of Massachusetts, and another four millions odd, to the State of Pennsylvania and the city of Philadelphia: these legacies are arithmetically possible, upon the wretched and ruinous principle of political economy, which he seemed early to have imbibed and recommended, but the ratio of human increase is not so; and still the "philosophers of Europe" continue to appeal to his notions on the subject, which, erroneous as they are, have this apology, that they were advanced for a very different purpose from that of checking the numbers of mankind.

CHAPTER IV.

OF THE POSSIBLE PERIODS OF HUMAN DUPLICATION, CONCLUDED.

(1) I HAVE given more attention to the preceding conjectures, or rather assertions, regarding the rapid periods of doubling hitherto examined, than they of themselves merited, because, as it appears to me, they are brought forward by the anti-populationists for a very special purpose, namely, that of introducing with greater effect and investing, with more apparent certainty, that ratio of human increase, for which, as with one consent, they contend; so that astronomers are less unanimous concerning the cycles of our planet, than they are about the natural progress of its population. If the reader can be but possessed with the idea that mankind may double in 10 years, or in 12⅘, or in less than 15 years, from procreation only, and that some of these extraordinary rates of increase have not only been realised at various periods, and in different places, but are still " short of the utmost power of population," the theory which allows the human race twice the average of these terms, in which to double their numbers, presents itself to him as having the highest claims to confidence, and comes recommended by a very large degree of apparent moderation. It is evidently announced with a view to produce this impression. " But," says the most confident of these writers, "to be perfectly " sure that we are far within the truth, we will take the " slowest of these rates of increase; a rate in which " all concurring testimonies agree, and which has been

" repeatedly ascertained to be from procreation only ; it " may be safely pronounced, therefore, that population, ' when unchecked, goes on doubling itself every 25 " years, or increases in a geometric ratio[1]."

(2) Justice to the important matter in dispute compels me to deny every part of this statement. That mankind multiply in any geometric ratio whatsoever, remains to be disproved; when a contrary principle, more consistent with the wisdom and benevolence of GOD, and the well being of mankind, will be developed and established: that the one in question has never been " ascertained" at all, unless mere unsupported and reiterated assertion can be so reckoned, I challenge any one to shew; in the mean time, I shall proceed to prove, that what all these " concurring testimonies agree" to assert, is utterly irreconcileable with facts.

(3) But in approaching more nearly the confines of possibility, it is obviously necessary to be less extravagant in our suppositions regarding the circumstances which contribute to human increase ; still, however, adopting such as are most favourable to it, and that are known to exist in countries where population is the most unrestrained and encouraged. And in doing this, to avoid all cavil or suspicion, I shall even here again adopt the plain data on which these doublings profess to be built. Mr. Malthus, referring to a paper in the Transactions of the Philosophical Society of Philadelphia, by Mr. Barton, notices that, according to the numbers given, the births in America are as 4½ to a marriage ; but adds, " as, however, this proportion was " taken principally from towns, it is probable that the " births are given too low ;" which observation is another instance of the grievous misquotations in which our author constantly indulges. Barton expressly in-

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[1] Malthus, Essay on Population, p. 5.

forms us, in the very sentence quoted, "that there is "but one instance in which he had been enabled to "obtain the actual proportion of marriages to births "in the country," which, he says, was the parish of Hingham, in the state of Massachusetts; and as that place, according to his computation, contained an average population of 927 souls only, even were American parishes no larger than those of England, still the population must have been as thinly scattered as that of our villages. There, it appears, that, during the term of 54 years, there were 2247 births, and 521 marriages, giving, consequently, 4.312 births to each[1], instead of 4½. Mr. Malthus's observation upon this piece of information, as we have already noticed, is this: "As, however, this proportion was taken principally from towns, it is probable that the births are "given too low; and I think we may very safely "take five for the average of towns and country[2]." Granting him even this proportion, unscrupulously as he has deduced it, and, likewise, that of 200 out of 351 of these births, as living to marry, it then follows that American marriages, one with another, produce nearly 2.85 children each, which survive to marry. Afterwards he calculates by a number of gratuitous assumptions, and, amongst the rest, by the very doubling which ought to have been first shewn possible, that 5.58 may be the prolificness of their marriages[3]: to give, then, the argument in favour of the geometric ratio, the benefit of the average of Mr. Malthus's suppositions, to the exclusion of Dr. Barton's recorded facts,—three children, which shall survive to marry, will be the proportion of American prolificness.

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[1] Transactions of the American Phil. Soc., vol. i., p. 30.

[2] Malthus, Essay on Population, vol. i., p. 483.

[3] Ibid., p. 484.

(4) In assuming twenty-three as the age of marriage in an unchecked population, like that of America, I anticipate, by four years, the average period assigned by Mr. Malthus, as obtaining in this country, and by one year the age fixed upon by our ancestors as that of discretion in the male sex; the period of whose marriage, it needs not be remarked, determines the distance of the succession of the generations; nor have I done this arbitrarily. None of the actual proportions which I have had an opportunity of examining, including those of Dr. Barton, would allow of its being placed so early. Mr. Warden, one of the most confident assertors of the rapidity of American increase, and most sanguine anticipators of its consequences, distinguishing in this respect New Hampshire, says indeed, that "it is rare to see there an unmarried man of thirty[1];" he might, with equal truth, have asserted just the same thing regarding the bulk of the people in old Hampshire, or, indeed, of any other shire of the mother country: but, in regard to another state, and decidedly one of the most prosperous of the whole, he is more explicit, and remarks, that the period of marriage, for males, is from twenty-one to twenty-five, which gives, on the average, the very ages I have chosen: but, he adds, that in this state the natives are remarkable, even in America, "for their early maturity[2]." That this period, therefore, is not anticipated in the other states, especially in the slave-holding ones, where concubinage prevails so lamentably, we may hold for certain; but, in order to prop up their theory, were the advocates of the geometric ratio, in spite of all authority to the contrary, to demand a still greater degree of precocity than is thus allotted to the Americans by their own writers, it will be seen, in the

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[1] Warden, Statistical, &c. Account of the United States, vol. i., p. 386.

[2] Ibid., vol. i. p. 501.

sequel, how little their supposition would favour human increase.

(5) In extending the period of life, as it respects the prolific part of the population, as far as 65 years, I have manifestly exceeded the truth in favour of their accumulation, and have even surpassed the pretensions of their own statistical writers in this particular.

(6) Upon these data, therefore, the most operative of which have been dictated to me by the advocates of the geometric theory, the following table has been constructed; and I do entertain a confident hope, that the trouble of extending it to a period almost co-extensive with the history of American colonization, and the scrupulous exactness which has been preserved throughout, may be recompensed by settling at least this question for ever. In its construction, I have again given away a great advantage to my argument, by contracting the term in which the births appear, to eight years, at least three short of the time which Nature would take to evolve the number assigned; and again, by invariably placing a surviving and prolific birth in the first year after marriage. Making the second the longer interval, will go but a very little way indeed in compensating for this liberality; but I have done thus, as in the preceding instances, purposely in order to obviate and silence any petty exceptions which, though not very easy to anticipate, may yet perhaps be taken, to weaken, if possible, the force of the demonstration, which, though not carried to its full extent, will be found overwhelming.

TABLE XXI.

SHEWING THE PROGRESS OF A POPULATION IN WHICH THE MARRIAGES TAKE PLACE AT 23 ; EACH HAVING, OUT OF 5,265 BIRTHS, THREE WHICH LIVE TO MARRY, ONE IN THE FIRST, AND THE REMAINDER IN THE FIFTH AND EIGHTH YEARS AFTER MARRIAGE, ALL SUCH SURVIVING TO THE AGE OF 65 ; THE EXISTING PROGENITORS OF THE TWO FIRST COUPLES BEING, THEREFORE, 2⅔ INDIVIDUALS.

Year.	Annual Marriages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.	Year.	Annual Marriages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.
..	..	..	..	..	2⅔	23	..	..	6	..	10
1	2	..	..	..	6⅔	24	..	..	6	..	10
2	..	2	2	..	8⅔	25	1	..	6	..	10
3	..	..	2	..	8⅔	26	..	1	7	..	11
4	..	..	2	..	8⅔	27	..	..	7	..	11
5	..	..	2	..	8⅔	28	..	..	7	..	11
6	..	2	4	..	10⅔	29	1	..	7	..	11
7	..	..	4	..	10⅔	30	..	2	9	..	13
8	..	..	4	..	10⅔	31	..	..	9	..	13
9	..	2	6	..	12⅔	32	1	..	9	..	13
10	..	..	6	..	12⅔	33	..	2	11	..	15
11	..	..	6	..	12⅔	34	..	1	12	..	16
12	..	..	6	..	12⅔	35	..	..	12	..	16
13	..	..	6	..	12⅔	36	..	..	12	..	16
14	..	..	6	..	12⅔	37	..	2	14	..	18
15	..	..	6	..	12⅔	38	..	..	14	..	18
16	..	..	6	..	12⅔	39	..	..	14	..	18
17	..	..	6	..	12⅔	40	..	1	15	..	19
18	..	..	6	2⅔	10	41	..	..	15	..	19
19	..	..	6	..	10	42	..	..	15	..	19
20	..	..	6	..	10	43	..	..	15	4	15
21	..	..	6	..	10	44	..	..	15	..	15
22	..	..	6	..	10	45	..	..	15	..	15

nnual ar-ages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.	Year.	Annual Marriages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.
..	..	15	..	15	76	..	..	28¾	..	22¾
..	..	15	..	15	77	¾	..	28¾	..	22¾
..	..	15	..	15	78	..	1	29¾	..	23¾
½	..	15	..	15	79	..	..	29¾	..	23¾
..	½	15½	..	15½	80	¾	..	29¾	..	23¾
..	..	15½	..	15½	81	¾	1	30¾	..	24¾
..	..	15½	..	15½	82	..	1½	32¼	..	26½
1	..	15½	..	15½	83	..	..	32¼	..	26½
..	1½	17	..	17	84	1½	..	32¼	..	26½
..	..	17	..	17	85	¼	3	35¼	..	29¼
1	..	17	..	17	86	..	1	36¼	..	30¼
½	1½	18½	..	18½	87	¾	..	36¼	..	30¼
..	1½	20	..	20	88	¾	1½	37¾	..	31¾
..	..	20	..	20	89	..	3	40¾	..	34¾
1	..	20	..	20	90	..	¼	41	..	35
..	3	23	..	23	91	¾	..	41	1	34
..	½	23½	..	23½	92	..	3	44	..	37
½	..	23½	..	23½	93	..	1	45	..	38
..	1½	25	..	25	94	¼	..	45	..	38
..	1½	26½	..	26½	95	..	1	46	2	37
..	..	26½	..	26½	96	..	1½	47½	..	38½
..	..	26½	2	24½	97	⅛	..	47½	..	38½
..	1½	28	..	26	98	..	⅛	47⅝	2	36⅝
..	..	28	..	26	99	..	1	48⅝	1	36⅝
..	..	28	..	26	100	..	..	48⅝	..	36⅝
..	½	28½	2	24½	101	½	..	48⅝	..	36⅝
..	..	28½	..	24½	102	..	⅞	49½	2	35½
¼	..	28½	..	24½	103	..	..	49½	..	35½
..	¼	28¾	2	22¾	104	½	..	49½	..	35½
..	..	28¾	..	22¾	105	¾	⅝	50⅛	1	35⅛

Year.	Annual Marriages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.	Year.	Annual Marriages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.
106	..	1¼	51⅜	..	36⅜	136	1⅞	15/16	84 15/16	½	56 7/16
107	..	..	51⅜	..	36⅜	137	5/16	3¾	88 11/16	..	60 3/16
108	1½	..	51⅜	..	36⅜	138	..	15/16	89⅝	..	61⅛
109	½	2½	53⅞	..	38⅞	139	1⅞	..	89⅝	¼	60⅞
110	..	1¼	55⅛	..	40⅛	140	1¼	3¾	93⅜	..	64⅝
111	¾	..	55⅛	..	40⅛	141	1/16	3¾	97⅛	..	68⅜
112	1½	1¼	56⅜	..	41⅜	142	⅝	⅜	97½	..	68¾
113	⅛	3¾	60⅛	..	45⅛	143	1⅞	1¼	98¾	1	69
114	..	⅝	60¾	..	45¾	144	5/16	6¼	105	..	75¼
115	1½	..	60¾	½	45¼	145	1/32	1⅞	106⅞	..	77⅛
116	½	3¾	64½	..	49	146	1¼	3/32	106 31/32	1	76 7/32
117	..	2½	67	..	51½	147	⅝	3⅛	110 3/32	1½	77 27/32
118	½	⅛	67⅛	..	51⅝	148	..	3¾	113 27/32	..	81 19/32
119	¾	1¼	68⅜	1½	51⅜	149	½	⅜	114 7/32	..	81 31/32
120	..	3¾	72⅛	..	55⅛	150	⅝	17/32	114¾	3	79½
121	1/16	⅝	72¾	..	55¾	151	..	4⅜	119⅛	1	82⅞
122	½	1/16	72 13/16	1½	54 5/16	152	3/16	15/16	120 1/16	..	83 13/16
123	..	2½	75 5/16	1½	55 5/16	153	25/32	7/32	120 9/32	1½	82 17/32
124	..	1¼	76 9/16	..	56 9/16	154	..	2 17/32	122 13/16	3	82 1/16
125	7/16	..	76 9/16	..	56 9/16	155	..	1¼	124 1/16	¼	83 1/16
126	..	1	77 9/16	3	54 9/16	156	1	..	124 1/16	..	83 1/16
127	..	1¼	78 13/16	½	55 5/16	157	⅝	1 3/16	125¼	3	81¼
128	5/16	..	78 13/16	..	55 5/16	158	..	2 1/32	127 9/32	1	82 9/32
129	⅝	⅜	79 3/16	1½	54 3/16	159	15/32	..	127 9/32	..	82 9/32
130	..	1 9/16	80¾	1½	54¼	160	1⅞	31/32	128 7/16	1	82 1/16
131	..	..	80¾	..	54¼	161	15/32	3 31/32	132 13/32	1½	84 17/32
132	1¼	..	80¾	..	54¼	162	..	1 3/32	133 3/16	..	85 11/16
133	⅝	2	82¾	1½	54¾	163	1⅞	..	133 3/16	⅛	85 9/16
134	..	1¼	84	..	56	164	1⅞	3 11/32	136 17/32	1	87 29/32
135	⅝	..	84	..	56	165	3/16	4⅜	140 29/32	..	92 9/32

Annual Marriages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.
$\frac{5}{8}$	$\frac{21}{32}$	$141\frac{9}{16}$	..	$92\frac{15}{16}$
$3\frac{1}{8}$	$1\frac{3}{32}$	$142\frac{21}{32}$	$\frac{7}{8}$	$93\frac{5}{32}$
$\frac{15}{16}$	$6\frac{7}{8}$	$149\frac{17}{32}$	..	$100\frac{1}{32}$
$\frac{3}{64}$	$3\frac{9}{32}$	$152\frac{13}{16}$	..	$103\frac{5}{16}$
$1\frac{9}{16}$	$\frac{15}{64}$	$153\frac{3}{64}$	$\frac{5}{8}$	$102\frac{59}{64}$
$1\frac{7}{8}$	$4\frac{1}{16}$	$157\frac{7}{64}$	$1\frac{1}{4}$	$105\frac{47}{64}$
$\frac{3}{16}$	$6\frac{7}{8}$	$163\frac{63}{64}$	..	$112\frac{39}{64}$
$\frac{17}{64}$	$1\frac{5}{16}$	$165\frac{19}{64}$	..	$113\frac{59}{64}$
$2\frac{3}{16}$	$\frac{15}{16}$	$166\frac{15}{64}$	$2\frac{1}{2}$	$112\frac{23}{64}$
$\frac{15}{32}$	$6\frac{7}{8}$	$173\frac{7}{64}$	$1\frac{1}{4}$	$117\frac{63}{64}$
$\frac{7}{64}$	$3\frac{9}{32}$	$176\frac{25}{64}$	..	$121\frac{17}{64}$
$1\frac{17}{64}$	$\frac{11}{32}$	$176\frac{47}{64}$	$1\frac{1}{4}$	$120\frac{23}{64}$
$\frac{5}{8}$	$3\frac{3}{32}$	$179\frac{53}{64}$	$3\frac{3}{4}$	$119\frac{45}{64}$
..	$4\frac{11}{16}$	$184\frac{33}{64}$	$\frac{5}{8}$	$123\frac{49}{64}$
$\frac{27}{32}$	$\frac{21}{32}$	$185\frac{11}{64}$	..	$124\frac{27}{64}$
$1\frac{1}{64}$	$1\frac{7}{32}$	$186\frac{25}{64}$	$3\frac{3}{4}$	$121\frac{57}{64}$
..	$4\frac{15}{32}$	$190\frac{55}{64}$	$2\frac{1}{2}$	$123\frac{55}{64}$
$\frac{21}{64}$	$1\frac{3}{32}$	$191\frac{61}{64}$	$\frac{1}{8}$	$124\frac{53}{64}$
$1\frac{53}{64}$	$\frac{7}{16}$	$192\frac{25}{64}$	$1\frac{1}{4}$	$124\frac{1}{64}$
$\frac{35}{64}$	$3\frac{15}{16}$	$196\frac{21}{64}$	$3\frac{3}{4}$	$124\frac{13}{64}$
..	$2\frac{3}{16}$	$198\frac{33}{64}$	$\frac{5}{8}$	$125\frac{49}{64}$
$1\frac{43}{64}$	..	$198\frac{33}{64}$	$\frac{1}{16}$	$125\frac{45}{64}$
$2\frac{3}{16}$	$2\frac{27}{32}$	$201\frac{23}{64}$	$2\frac{1}{2}$	$126\frac{3}{64}$
$\frac{21}{64}$	$5\frac{1}{32}$	$206\frac{25}{64}$	$1\frac{1}{4}$	$129\frac{53}{64}$

Year.	Annual Marriages.	Annual Births.	Total Births.	Annual Deaths.	Total Living.
190	$\frac{35}{64}$	$\frac{7}{8}$	$207\frac{17}{64}$	..	$131\frac{45}{64}$
191	$3\frac{7}{16}$	$\frac{7}{8}$	$208\frac{9}{64}$	1	$130\frac{37}{64}$
192	$1\frac{41}{64}$	$6\frac{15}{16}$	$215\frac{5}{64}$	$1\frac{1}{4}$	$136\frac{17}{64}$
193	$\frac{15}{128}$	$4\frac{3}{8}$	$219\frac{29}{64}$	..	$140\frac{41}{64}$
194	$2\frac{1}{32}$	$\frac{57}{128}$	$219\frac{115}{128}$	$\frac{3}{8}$	$140\frac{91}{128}$
195	$3\frac{7}{16}$	$4\frac{1}{4}$	$224\frac{19}{128}$	$1\frac{9}{16}$	$143\frac{51}{128}$
196	$\frac{21}{32}$	$9\frac{1}{16}$	$233\frac{27}{128}$	..	$152\frac{59}{128}$
197	$\frac{15}{32}$	$2\frac{5}{8}$	$235\frac{107}{128}$	..	$155\frac{11}{128}$
198	$3\frac{7}{16}$	$1\frac{17}{128}$	$236\frac{31}{32}$	2	$154\frac{7}{32}$
199	$1\frac{41}{64}$	$8\frac{29}{32}$	$245\frac{7}{8}$	$1\frac{1}{4}$	$161\frac{7}{8}$
200	$\frac{11}{64}$	$6\frac{21}{32}$	$252\frac{17}{32}$	..	$168\frac{17}{32}$
201	$1\frac{35}{64}$	$\frac{121}{128}$	$253\frac{69}{128}$	$\frac{15}{16}$	$168\frac{77}{128}$
202	$2\frac{11}{32}$	$4\frac{3}{64}$	$257\frac{75}{128}$	$3\frac{3}{4}$	$168\frac{115}{128}$
203	$\frac{21}{64}$	$9\frac{7}{32}$	$266\frac{103}{128}$	$\frac{15}{16}$	$177\frac{23}{128}$
204	$\frac{39}{64}$	$2\frac{5}{8}$	$269\frac{55}{128}$	..	$179\frac{103}{128}$
205	$2\frac{15}{64}$	$1\frac{17}{32}$	$270\frac{87}{128}$	$3\frac{3}{4}$	$177\frac{39}{128}$
206	$\frac{35}{64}$	$7\frac{7}{32}$	$277\frac{115}{128}$	$3\frac{3}{4}$	$180\frac{99}{128}$
Totals	$97\frac{125}{128}$	$277\frac{115}{128}$		$97\frac{1}{8}$	$180\frac{99}{128}$
	× by 3		Births due to the Marriages of 197, 200, 201, 202, 203, 204, 205, and 206.		$+97\frac{1}{8}$ $+16\frac{1}{82}$
	$293\frac{119}{128}$				$293\frac{119}{128}$

$97\frac{125}{128}-2$ (the first couples) $=95\frac{125}{128}$ which, doubled, are $191\frac{61}{64}$ the births to 183.

(7) Previously to making any deductions from the preceding table, I will just observe, that neither in it, nor any of the foregoing ones, have I made any computations regarding second marriages. Indeed, in the first tables, it would have been preposterous to

have done so, as no deaths whatever are accounted for throughout; and, in the latter, where mortality is included, it would have been as evidently absurd to add second marriages, with a view to their effect upon human increase, as no deaths are supposed to take place during the term of human fecundity, nor till each individual, arrived at the nubile age, had furnished the full average quota of prolificness to the general increase—a supposition extravagantly favourable to the progress of population. Had I included second connexions in the tables immediately preceding, the facts would indeed have been still more striking, for reasons which must be obvious on the slightest consideration. To have done so, however, would have unnecessarily complicated the calculation, the results of which are already sufficiently conclusive.

(8) We now proceed to examine how far the very prolificness contended for by our anti-populationists as existing in America, the country of their demonstrations, where, we are informed, no human consideration "operates as a hinderance to reproduction," will bear out their repeated and confident assertions respecting their geometric ratio of duplication. Arithmetic, from whose decision there is, in these cases, no appeal, thus disposes of this important dispute.

(9) Commencing first with the year after the marriage of our first couples, there are then in existence $8\frac{2}{3}$ individuals; these doubled every 25 years, 8 times, would bring the period down to the year 202, and would give, according to our geometricians, $2218\frac{2}{3}$ souls. But what would be the actual number in being at the latter period, allowing arithmetic to determine? —168, and (to be exact) $\frac{115}{128}$ parts of another! In the year 6, there are $10\frac{2}{3}$ persons in the table; these,

doubled as before, would amount to $2730\frac{2}{3}$; but, in the year 206, to which those doublings would extend, there are $180\frac{99}{128}$ only found;—less than one-fifteenth part! Particular periods may indeed be selected in the table, whence to commence the series, which will somewhat diminish these enormous disproportions; but then these periods will exhibit population under circumstances such as never exist in reality, as has been before sufficiently adverted to. Thus, were we to begin reckoning from the year in which the first marriages take place, and before a single child has been born, and when, therefore, the actually prolific are nearly two-thirds of the whole, the $6\frac{2}{3}$, doubled 8 times, would, according to our theorists, become, in the year 201, $1706\frac{2}{3}$ individuals; but, alas for their accuracy, less than one-eleventh of their calculation, only $168\frac{71}{128}$, are found in this instance, favourable as it is to the principle of multiplication! Nothing, therefore, can redeem their confident assertion regarding their "slowest rate of increase," in making which they are so "perfectly sure that they are far within the truth," and concerning which it appears that "all concurring testimonies agree," from being one of the wildest and most fallacious guesses that ever imposed upon the credulity of mankind.

(10) Is it necessary still further to pursue the hypothesis I am combating? It would hardly be worth the pains, but that the means of doing so are already at hand. To cut it off, then, from all possible retreat, we will allow Mr. Malthus to amend his first supposition regarding American prolificness, which he has so singularly deduced from Dr. Barton's numbers, not by any minute alteration, (for that, it is already sufficiently plain, could not answer the purpose,) but by the enormous addition of nearly one half, and permit him to

give to American marriages, one with another, four surviving and prolific births, which, on his own calculation, would demand upwards of seven children, on the average, from every such connexion; and, moreover, we will agree that these marriages should take place at the age of twenty, which, it is presumed, will leave little room for dilating on the effects of the "preventive check," and even these proportions, extravagant as they are, would not produce the slowest rate of increase which our anti-populationists, with so much apparent moderation and candour, assume as naturally that of our species. The Twentieth Table, in the preceding chapter, is already constructed, as it happens, upon these precise proportions, with the view of examining Dr. Franklin's term of duplication, of once every twenty years; and if that term be extended to five-and-twenty, it will be found that the augmentation, rapid as it necessarily is under such circumstances, still falls short of this "slowest rate of increase." Thus, to commence with the second year, eight doublings of 25 years each bring us to the year 202, when there are $1528\frac{84}{32}$ found in the table; but this number falls short, by upwards of 50 per cent., of the 2304 which the geometric ratio requires; a still greater deficiency occurs in succeeding dates, and one which perpetually increases as the table advances; but these will not now be particularized, and I shall only add, that all I have said regarding the monstrous exaggerations on which Dr. Franklin founded his supposition, receives a strong corroboration from one of the most sanguine writers on American increase, who founds what he conceives to be the demonstration of his theory upon it, stating five to be the proportion of births, including towns and country throughout the Union, which number he subsequently augments into 5.58.

(11) The average of the latter proportions I have adopted, as before explained, in the preceding table; nor am I disposed to cavil regarding their accuracy, in a population under circumstances eminently favourable to human multiplication, which circumstances, however, it will be seen, are of a very different nature to those usually recognized as contributing to that effect. Indeed, the principle which I shall develop, and, I trust, establish, admits in such instances, as it will be seen hereafter, the largest measures of increase which are consistent with truth, and places them amongst the number of its proofs. The last calculation may therefore represent, accurately enough, the progress of a community unrestrained by any circumstances affecting its population, and, I am inclined to think, is quite as rapid as that which is, on the average, taking place from natural generation in the United States.

(12) If we add to the last table the births which, as not living to marry, do not contribute to the relative increase of the population, but which must, nevertheless, be taken into account if we would estimate the annual prolificness of marriages; and, in like manner, add their deaths, to those of the adult and prolific part of the community, in order to find the annual ratio of mortality; adding, at the same time, a proper proportion of these unproductive births, as that by which the population is, on the average, constantly and actually, though not relatively, augmented; we shall then obtain the data on which to calculate the proportions of annual fecundity and mortality in a community circumstanced as previously explained. In the succeeding table, the former one is divided, as far as the year 200, into ten equal periods of twenty years each; and the sum of the marriages, births, and deaths, in each are given, which, together with the subsequent addi-

tions, must of course be divided by twenty, to obtain the mean annual numbers by which to divide the population, the mean number of which, in each period, is given throughout. The prolific births are, therefore, increased in the proportion of 351 to 200, to obtain the entire number, and the difference gives the unprolific births, or those who die in infancy, and unmarried. Of these, two-thirds are supposed to die during the terms in which they are born, respectively, and one-third in the ensuing term; the deaths are, therefore, rectified accordingly: and, lastly, one-third of these unproductive births are added to the mean amount of the numbers in existence during the period in which they are born; as the standing addition they may be supposed to make to the population. The results will then be as in the annexed table, XXII.

TABLE XXII.—Exhibiting the results of preceding one divided, to the Year 200, into Sections of 20 Years each, and containing the presumed Proportion of Unprolific Births throughout.

	Marriages.	Prolific Births.	Unprolific Births.	Total Births.	Adult Deaths.	Infant Deaths.	Deaths in nonage, &c.	Total Deaths.	Prolific Population.	Surviving unprolific population.	Total Population.	Mean Annual proportion of Marriages, 1 in	Mean Annual proportion of Births, 1 in	Mean Annual proportion of Deaths, 1 in
1 to 20	2.	6.	4.53	10.53	2.66	3.02	..	5.68	10.76	1.51	12.27			
21 40	3.	9.	6.79	15.79	..	4.53	1.51	6.04	13.45	2.26	15.71			
41 60	4.	5.	3.78	8.78	4.	2.52	2.26	8.78	16.7	1.26	17.96			
61 80	2.25	9.75	7.36	17.11	6.	4.91	1.26	12.17	24.31	2.45	26.76			
81 100	5.125	18.87	14.24	33.11	6.	9.49	2.45	17.94	33.37	4.75	38.12			
101 120	9.375	23.5	17.74	41.24	5.	11.83	4.75	21.58	42.13	5.91	48.04			
121 140	9.75	21.25	16.04	37.30	11.75	10.69	5.91	28.35	56.53	5.35	61.88			
141 160	11.84	35.06	26.47	61.53	17.25	17.65	5.35	40.25	78.89	8.82	87.71			
161 180	18.53	56.73	42.83	99.56	14.75	28.55	8.82	52.12	105.02	14.28	119.30			
181 200	25.49	67.42	50.9	118.32	23.25	34.	14.28	71.53	137.05	16.9	153.95			
	91.36			443.26				264.44	518.26	63.49				
Mean Annual No.	4.57			22.67				13.22			581.7	$127\frac{3}{10}$	$25\frac{6}{10}$	44

(13) In this table, as well as those immediately preceding, I have omitted including any calculations regarding second marriages, (a subject which will be attentively considered hereafter;) but, then, as previously observed, I have made no deductions for the premature dissolution of first ones; none for that portion of the community which, in every country, however favourable to matrimony, will remain in a state of celibacy; and, while it is assumed that second marriages may partly compensate for these circumstances, the illegitimate births may also supply the comparative want of prolificness in such subsequent connexions. On the whole, it is conceived, that these additions would also preserve the above relative proportions in a sufficient degree of exactness, and actual precision regarding them is neither necessary nor attainable.

(14) The preceding table, therefore, when thus minutely examined, affords a strong confirmation that Mr. Malthus's suppositions, respecting the prolificness of American marriages, and the proportion of their born which lives to marry, are not very wide of the truth. By this, it appears, that there may take place 1 birth in $25\frac{6}{10}$, 1 death in 44, and 1 marriage in $127\frac{2}{10}$, of the entire population; which last proportion may, indeed, be increased by second marriages, but not to the extent supposed, as remains to be shewn. These proportions are far beyond what Chateauneuf states to be those of Europe, namely, 1 birth in 30.1, and 1 death in 40.3; the fecundity of marriages being four children each, one with another: but the true theory of population reconciles us to this important variation, and, indeed, demands it. In proof of its general accuracy, I refer to a statistical document, recently published, relative to the large and flourishing

state of New York, doubtless one of the most prosperous in the Union, and where there are, even at this time, less than thirty inhabitants in the square mile; and, above all, where the increase has been far greater than a doubling in twenty-five years, and has, indeed, amounted to a quadruplication in thirty years, in which we find the births 1 in $26\frac{77}{100}$, and the marriages 1 in 139, on the entire population—the average births to a marriage, on the authority of the same document, being $5\frac{88}{100}$; in every way, therefore, the proportions, though not varying materially, yet exhibit them more favourably for the principle of population than they exist in the entire state of New York.

(15) But while the correctness of the supposition of this author in regard to the proportions in question is thus verified, what becomes of his repeated assertions regarding the rapid doublings of American population, independently of emigration, which he pronounces, over and over again, to be immaterial to its progress, and which, it appears, some of his coadjutors imagine they have demonstrated to be so? By the table, I think the numbers will be found, on the whole, to double in somewhat more than 47 years. The state of New York, in which his suppositions regarding the prolificness of marriages under favourable circumstances are so nearly substantiated, has rather more than quadrupled its numbers in thirty years; precisely the rate of increase for which he contends, as one that "cannot be doubted" to have occurred in particular districts, and from procreation only; adding, that "even this "extraordinary rate of increase is probably short of "that of the utmost power of population." Now, where is the district of the New World more favoured than that of the state of New York, and where are the impediments *to propagation* fewer, or the inducements

to it greater, than there? To follow, then, his example, and to illustrate the all but infinite distance between the operation of his own theory, and the necessary results of those facts which he himself deliberately advances in support of it, by carrying out the calculations of each for a few places of figures only; suppose for a little more than four centuries. The rate which he contends as short of that which population has the power to produce, and which has, he informs us, existed in various districts, independently of emigration, and which, as we have seen, actually has taken place in the state of New York, would multiply 100 individuals, in 420 years, into upwards of 26.843 millions; whereas the very prolificness which he attributes to the Americans would increase the same original number, in nearly the same period, to 51,200 only; not half the population of the city of New York. But to take his "slowest rate" of American increase, the geometric ratio for which he contends, that of 25 years; this would, in 425 years, multiply the same 100 persons into 13.107,200, whereas the increase, resulting from his own measure of prolificness, as evolved in the table, would produce, in about the same term, the number before mentioned, less than 52.000: the first computation, on the geometrical ratio of calculation, exceeding the sober proportions of nature and of truth, in the rate of exactly 524.288 to 1; and the latter, (the very slowest admitted,) in that of 526 to 1.

(16) Differences so vast and irreconcileable as these, have led me to re-examine the calculations involved in the preceding tables, and to re-consider the principle on which they are constructed; and I have not been able to detect any error in either; while I am confirmed in their accuracy, by simply adverting to the *experience of* human beings in all ages and countries

of the world, and the plain manifestations of an overruling Providence. What then become of the "demonstrations" so profusely put forth in proof of the fact, that the New World thus doubles from internal generation only, and that the "evil" principle of population is about to overwhelm us in the Old? The very term is degraded by being so applied—Demonstrations! The prophecies of the merest visionary are infinitely more deserving of the name; these may, by chance, turn up truths,—it is impossible those ever should become so.

Since writing the above, I have accidentally adverted to certain facts, which, in addition to those already mentioned as existing in the State of New York, abundantly corroborate the general accuracy of the last table, and the assumptions on which it is founded. It was meant, as previously stated, to illustrate the progress of a population where the laws of nature, in respect of reproduction, should be allowed to operate under favourable circumstances, and unrestrained by the "preventive check." There is a country less distant than America, where such is the case; where we know of a certainty, that the present production exceeds the consumption, and where that excess might be multiplied an hundred fold, if there were a sufficient demand; where marriages meet with no obstacles, and are, we are assured, unusually prolific, and where a paternal, though arbitrary government fosters, to the full extent of its mighty means, the increase of its subjects; a country, moreover, which nature still further favours by the extraordinary degree of healthiness with which it is endowed: an empire, in a word, which Mr. Malthus himself acknowledges as an exception to the rest of the civilized world, at least of the Old World, in being not sufficiently peopled—I need hardly say, I refer to Russia. Consulting then the census of 1820, we find the population of that empire belonging to the Greek communion to be 40,351,000; the marriages amongst whom that year amounted to 317,805; the births, to 1,570,399, and the deaths to 917,680. I shall place the proportions these numbers give in connexion with those of the table last constructed; they are these:

	1 Marriage in every	1 Birth in	1 Death in
In the Table......	$127\frac{2}{10}$	$25\frac{6}{10}$	44
In Russia.........	$126\frac{9}{10}$	$25\frac{7}{10}$	$43\frac{9}{10}$

It need not be observed how surprisingly near these results are, not to be precisely identical, affording therefore a mutual and decisive proof of correctness in both instances. What renders this uniformity the more satisfactory is, that I had not the remotest idea of aiming at these, or, indeed, any other precise proportions when I constructed the table; and if I had, I should probably have found it difficult to approach them so closely. On the contrary, conceiving that the fecundity assigned to American marriages by the author so frequently alluded to, might very well represent, and certainly did not fall short of, what obtains in a community favourable to increase; and fixing on such periods both of marriage and mortality, as I supposed might probably prevail under such circumstances; and moreover, evolving in as rapid a period as was at all consistent with the laws of nature, the prescribed number of births; lastly, taking, as destined to become prolific, that proportion of the latter which had been already assigned to them, I constructed the calculation accordingly. The result is gratifying. The principle on which the preceding tables are constructed is thus fully sanctioned, and the utter impossibility of the unfounded assertions on which the rash and revolting theory I am confronting is built, is proved by a reference to the laws of nature, as collected from the suffrages of forty millions of human beings, placed probably under circumstances more favourable to their multiplication than have often been experienced for an equal length of time in any age or country of the world, excepting only on those occasions when we are instructed to believe that the laws of nature were modified by the Power who gives them, in order to fulfil those designs,—which, it appears, we are now to suppose no longer engage His attention,—of replenishing the earth, and proportioning its inhabitants to the space and sustentation provided for them.

CHAPTER V.

OF THE IMPOSSIBILITY OF THE GEOMETRICAL DUPLICATION OF HUMAN BEINGS; DEMONSTRATED BY THE LAW OF MORTALITY.

(1) The preceding chapters having sufficiently exposed the absurdity of the suppositions of the antipopulationists, regarding the possible periods of human duplication, the present one will shew, that however much they may amend their conjectures as to the term of those doublings on which they may still hope to found their theory, the geometrical ratio of human increase is, nevertheless, in itself, an impossibility; and this I shall not now demonstrate by that principle of increase which has not, I think, been heretofore developed, and which is reserved for consideration in the succeeding Book; but by the evidence of facts with which all statistical writers have been long perfectly familiar, namely, the ratios of mortality.

(2) These ratios are not fixed and arbitrary, but are influenced by the different degrees in which the population is condensated. Thus, other circumstances being similar, the relative number of deaths in a thinly populated, or country district, is less than that which takes place in towns; and in towns of a moderate size less again than that which exists in large and populous cities.

(3) That these facts are utterly subversive of the geometric theory will be shewn hereafter, though it seems unnecessary to demonstrate what must be instantly apparent. It is almost as superfluous to pre-

sent any proofs of their reality, from their being so universally notorious. I shall not, therefore, exhibit a series of original calculations on this point, but merely present the results at which others have arrived who have given the subject their careful attention.

(4) Susmilch, so often and so deservedly appealed to on every subject connected with population, thus estimates the difference in the variable ratio of human mortality. In country places, he calculates the annual proportion to be, 1 in from 40 to 50; in moderate sized towns, 1 in 28 to 31; in great towns, 1 in 24 to 28[1]. Dr. Price's calculations are still less favourable to a crowded population; his proportions of deaths are varied thus: in the country, $\frac{1}{35}$ to $\frac{1}{60}$; in moderate sized towns, $\frac{1}{23}$ to $\frac{1}{28}$; in great towns and cities, $\frac{1}{19}$ or $\frac{1}{20}$ to $\frac{1}{23}$ or $\frac{1}{24}$[2]. Dr. Black arrives at a similar conclusion, by a somewhat different mode of calculation; he says, there is, "on an average, 1 death annually out "of every five families in cities; but in country towns "and open districts, 1 in 7, 8, and 9; and in a few "healthy places, 1 out of every 10 families.[3]" Crome, who has taken a wide view of this subject, has divided the states of Europe into three classes; and, upon precisely the same principle as that laid down by the preceding authorities, has stated that the ratio of mortality in each is to be estimated by their populousness. In the richest and best peopled countries, where the inhabitants of the towns are to those of the country as 1 to 3, he estimates the mortality as 1 in 30; in those where there is a middle state of population and production, as 1 in 32. In the thinly peopled northern states, as 1 in 36,—Susmilch's proportion[4]. These results, in the present improved state of society, are

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[1] Susmilch, Gottlich Ordnung.

[2] Dr. Price, Reversionary Payments, vol. ii, p. 296.

[3] Black, Med. Analysis, p. 8.

[4] Crome, Europaischen Staaten, p. 127.

obviously too unfavourable, but still the relative proportion of mortality which they uniformly establish, in reference to a scanty or a condensated population, under circumstances otherwise similar, remains, and fully establishes the point at issue.

(5) The same law of mortality prevails, as it might be expected to do, in the New World also. The registers of the great towns of North America bear full testimony to this fact; and, in the southern part of that continent, Humboldt has noticed the same circumstance, and instanced, in particular, the great difference in the rate of mortality in Mexico, compared with that which exists in the circumjacent country[1].

(6) In a word, the ratio of mortality thus regulated by the comparative density of the population, in the same country and under like circumstances, is a fact evidenced by all registers, and commented upon by all writers who have touched upon the subject, and especially by every medical authority. The latter may be regarded as the most competent judges upon this point, particularly if they have given the subject of medical statistics sufficient attention, as was particularly the case in the instance of Dr. Short[2], Dr. Perceval[3], and Dr. Black. The last of these writers observes, in his Analysis, that "*cæteris* " *paribus*, the relative mortality in cities will bear a " proportion to their size[4]." We have already seen, that he stated the same proportion to diminish, where the population was less, that is, in country places. These facts contain the whole of the data required for the present demonstration.

(7) If, then, as mankind increase, villages become

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[1] Humboldt's Personal Narrative, vol. ii., p. 86.

[2] Dr. Short, New Observations, pp. 57. 60, 61. 65.

[3] Dr. Perceval, Works, vol. ii., p. 324.

[4] Dr. Black, Medical Analysis, p. 110.

more numerously inhabited, some of them rise into towns, and towns again enlarge into cities, and cities also augment in populosity, all which is the inevitable consequence of enlarging numbers, which ever accumulate more rapidly, in such circumstances, in the crowded than in the country districts of a nation; it follows, as inevitably, that the general ratio of mortality must increase as the inhabitants thus multiply, other things remaining the same. The geometrical ratio of human increase, therefore, is plainly an arithmetical impossibility. No such progression ever has existed, or ever can exist, so long as the preceding fact relative to human mortality remains the law of Nature; or till an equal and unalterable proportion of deaths, under circumstances the most opposite, as to population, shall take place; a supposition, false in itself, and equally opposed to all past observation, and present experience.

(8) It is true that, within the last half century, a very considerable improvement in the duration of human life has taken place, and especially by the introduction of vaccination; but it would be absurd thence to argue the gradual and indefinite elongation of the term of our existence. I much fear, indeed, that some of the calculations founded on the data furnished during the period in which this improvement has taken place, will turn out to be erroneously favourable to the expectation of life. Be that, however, as it may, differences in the proportion of mortality, comparing towns and country places together, of precisely the same nature as those already brought forward, still exist, and are in full operation; as will be seen by the tables in the succeeding Book, which will incidentally prove this fact, though they were constructed for different purposes.

(9) I maintain, therefore, that the position of Mr. Malthus, upon which his whole theory, and the reasonings and deductions which he has connected with it, are founded, namely, "that population, when "unchecked, goes on doubling every twenty-five "years, or increases in a geometrical ratio[1]," and "that a thousand millions are just as easily doubled, "every twenty-five years, by the power of population, "as one thousand[2],"—is, as it respects its natural progress, not only erroneous, but impossible:—utterly inconsistent with the very principle of arithmetic, in consequence of the operation of that which is as sure and immutable,—the law of mortality.

(10) Perhaps the advocates of this favourite theory may attempt its defence, by alleging, that this variation in the rate of mortality is resolvable into the general checks to population, which they have enumerated. This would, however, be a mere quibble; as well might they describe death itself as one of those checks; on the contrary, it forms, as modified by the circumstances in question, (which must exist, while human society endures,) an essential constituent of the law of population. If, however, such persist in classing these modifications in the law of mortality, which are as sure and universal as mortality itself, under the head of one of the three main checks to population, it must be under that of "vice," or "misery," or, perhaps, both: "moral restraint," having reference to reproduction only, and not to dissolution, is plainly out of the question. Let us then examine a little into this argument, if argument it may be called.

(11) First, increasing vice is not the necessary consequence of an accumulating population, nor, as it regards the more heinous offences, is it its actual

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[1] Malthus, Essay on Population, p. 5. [2] Ibid., p. 5.

result. On the contrary, mankind are not more ignorant merely, but more depraved, under otherwise similar circumstances, when they are more thinly scattered, than when they are more closely associated. The fact is incontrovertible, and the reasons, into which I shall not enter, must be equally familiar to the moralist and the politician. On the other hand, I do not mean to deny, but that pernicious pursuits and habits may be occasionally, but unnecessarily, introduced more into a crowded, than into a thin population. But after every allowance has been made on this ground, if any be necessary, still it will be found that the rate of mortality falls the heaviest, wherever the population is the most dense; or, in other words, that, out of an equal number of individuals, taken from a crowded city, and a country district, the same in moral habits, a larger number of deaths would occur in the former, than in the latter case; and this is the argument.

(12) Misery, then, is the only remaining check to which the greater degree of mortality, occurring in a more condensated population, can be attributed, and this is still wider of the truth than the former supposition, and less needs a laboured refutation. The simple fact that, in a prosperous state of society, the towns increase in a yet greater ratio than the country places, and in consequence of the resort of the natives of the latter to the former, is conclusive evidence on this point, so long as we allow human beings to be governed, as far as possible, by a propensity to shun misery and seek happiness. Nor can it be argued that, in thronging to the more crowded districts, they err in this respect; no doubt can exist that the bulk of the people fare better in these situations, as, I must repeat, their great increase from the constant acces-

sions from the country fully proves. And, as it respects the higher ranks of society, whose place of residence is a matter purely of preference, it hardly need be remarked, that their predilection for crowded society, wholly negatives the idea, that it is identified with a state of comparative misery. My convictions are all to the contrary. I believe man to be, in the fullest sense of the term, a gregarious being; and though I am aware that this propensity, like all his others, may be abused in its indulgence, still, notwithstanding all the eulogiums pronounced upon solitude, (by those, however, who are still musing upon, and wishing to be contemplated by, as well as occasionally to mingle with, the crowd,) society, even in a very advanced stage, is favourable to man, both as it respects his moral and his intellectual attainments. In my views of the nature and origin of society, I differ from those who trace it to the consciousness of individual wants and necessities; I attribute it rather to the wish for mutual comfort and happiness, and I cannot, therefore, but regard the civic state as natural to man. History fully justifies this view; hence, however thinly any country was peopled of old, its inhabitants were still, very generally, closely associated. And, I confess, it has sometimes entered into my speculations, that as something like this state of population may be the most natural, and as, in the increase in its numbers, it has a tendency to become general, so it is not impossible but that it is to such a state of things that Nature has adapted her calculations, whether of human increase or mortality; never, however, conceding that it is once resolvable, in any sense of the term, into " misery," or that check to population which is so denominated; for, whether the animal or intellectual enjoyments of mankind are considered, it cannot be doubted but that both are, generally speaking, the more highly gratified, the more numerous and permanent is their association.

(13) As to the small abridgment in the average duration of life which takes place in crowded, compared with solitary, districts, that cannot, by any ingenuity of interpretation be resolved into "misery." On any such supposition, the inhabitants of France, for instance, must be melancholy, because they are not on the whole so long lived as those of Norway; and the whole race of mankind, indeed, perfectly miserable, because they do not survive to the age of the antediluvians. Human happiness is never embittered by any such considerations; and if, as a modern philosopher has asserted, life is to be estimated by its pleasurable sensations, it is not unlikely but that Nature, by one of those compensatory laws which run through all her operations, may crowd at least an equal measure of enjoyment into the shorter span of human existence. However this may be, the constant influx of individuals, of the lower ranks, from the country into towns and cities, with the sole object of bettering their condition in life, and the voluntary resort to the latter of those in affluence, and whose choice of residence, therefore, is solely guided by the prospect of pleasure, are, as before observed, decisive proofs that the greater degree of mortality which prevails in these more crowded resorts, is not resolvable into the check to population,—"misery." On the contrary, it is by no means unlikely, that the superior degree of personal enjoyment generally experienced by the inhabitants of towns and cities, compared with the condition of those in country districts, without at all adverting to any criminal indulgences, is itself the cause of this inferiority in the average term of life. I might bring forward no

mean authority in favour of this view of the subject: Bacon, in his History of Life and Death, asserts, that "Men live longer, for the most part, when they fare " less deliciously, and are more given to bodily exer- " cise; shorter, when they abandon themselves to luxury " and ease[1]." But, it is with the fact, as distinct from misery, with which I have to do; and that is undoubted.

(14) I cannot refrain from remarking, lastly, that the difference in these ratios of mortality falls principally upon the first stage of life, very early infancy. Thus, we learn from Major Graunt[2], Dr. Short[3], Dr. Price[4], Dr. Black[5], and almost every writer who has accurately attended to the subject, that, after that period, the chance of living, or the duration of human life, is nearly, if not altogether, as favourable in towns as in country places. The means of preserving the real balance of population, then, as far as mortality is the corrective, is of the most lenient character possible; worthy of the merciful Being with whom are the issues of life and death; and by no means resolvable into the check to which we have been alluding. Death, in the initial period of human existence, leaves no chasm in the social system. The stroke may cause a temporary pang, but does not inflict an immedicable wound: an object of solace may be abstracted, but a pillar of support is not broken, nor has the paternal roof fallen in, and domestic desolation ensued. Nay, the loss of an infant occasions a feeling distinct from misery, even in the maternal bosom; "The mother may not indeed forget her sucking child," but she will remember it as surviving in a better place, and "always

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[1] Bacon, History of Life and Death, pp. 20, 21.

[2] Graunt, Observations on the Bills of Mortality, p. 63.

[3] Dr. Short, New Observations, p. 63.

[4] Dr. Price, Reversionary Payments, vol. i., p. 241.

[5] Dr. Black, Medical Analysis, pp. 20, 21.

beholding the face of its heavenly Father." The heart thus becomes at once softened and elevated, and, instead of being lacerated, feels solaced at the recollection of an event which, generally speaking, every family has to experience, though those in the situations I have been describing, in somewhat larger proportions. But, I forget that I am arguing with a theory, which regards not these feelings; which pronounces infant existence worthless to society, and which has insulted the matrons of the country, as those who only gratify selfish propensities, when, in obeying the dictates of Nature and of God, they gave to their country its glory and its defence! But, I will not give full utterance to my abhorrence of a system which generates such views and such principles.

(15) In conclusion; I repeat that the varying ratios of mortality which have always existed, and which still continue to prevail in different degrees of population, differences totally distinct from, and independent of, the checks whether comprised under the heads of vice, misery, or moral restraint, are utterly subversive of the geometrical ratio of human increase, and of all the deductions founded on so fallacious and impossible a theory. In proceeding to detect other arithmetical errors of the same system, I shall next shew what might occasion, for a certain length of time, the rate of increase alleged; a cause, however, of which the anti-populationists have been anxious to deny the existence; or, at least, to dispute the effect,—I mean Emigration.

CHAPTER VI.

OF THE EFFECTS OF EMIGRATION ON THE INCREASE OF POPULATION.

(1) As the sole proofs of the existence of the geometric ratios of human increase, on which the theory of superfecundity is founded, are said to be derived from various parts of America, and as the slowest of them is supposed to be established upon the progressive augmentation of the inhabitants of that entire country, it became essential that the demonstration, as it is called, should be guarded by an assertion of a most extraordinary nature, namely, that with respect to such increase, emigration is quite " immaterial." The recent and well known origination of those settlements; their annual history from that period to the present hour; the evidence the very structure of society there affords, together with the local, and even domestic knowledge, not only in every part of the British islands, but throughout Europe, (of which they have now become the colony,) of these vast and constant deportations, are wholly disregarded. Emigration is pronounced by the " Philosophers of Europe," advocates of the prevailing principle of population, to be " immaterial," and the idea is too flattering to the patriots of America, not to be eagerly adopted by them; and " when they do agree, their unanimity is wonderful;"—miraculous indeed, it may well be called, in this instance, investing, as it does, mankind with a faculty of increase which, I trust, it has been already proved, involves a series of physical impossibilities.

(2) Amongst the many singular circumstances connected with this argument, these are not the least surprising—that regarding a country whose inhabitants have, within a few generations past, sprung from emigration solely, emigration should be pronounced immaterial; and that while an extraordinary degree of prolificness in the human race is attempted to be deduced from the increase of the native population, that of these emigrants is often either wholly disregarded, or its effects as much as possible evaded, by presenting its increments in short terms only, and thereby all but entirely concealing the necessary results of continued accumulation. These circumstances have, indeed, been already attended to; so have likewise the following: but while assertions, however unfounded, are made, by constant and confident repetition, to stand for demonstrations, the proofs of their fallacy may be occasionally iterated. That there are only 10,000 emigrants annually added to the American population I totally disbelieve; but as the number may, after all, be made a matter of debate, the denial will not now be further persisted in: but that that number, with an annual increase of 3 per cent. upon it, is "immaterial," is, without dispute, one of the most egregious mistakes ever made. It has been already stated, and may be very properly repeated here, that an annual accession of 10,000, with 3 per cent. increase thereon, would, in a single century, amount to 6,752,666 out of the 7,861,710 white inhabitants which the United States contained in 1820, or nearly nine-tenths of the entire number: extended a very few years further, it would absorb the whole. Mr. Malthus has, indeed, only commenced his calculation, relative to this annual emigration, with the year 1782[1]; but I think it will

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[1] Malthus, Essay on Population, p. 339, note.

be quite as difficult for him to persuade the historian that emigration first began at that period, as to convince the arithmetician, that even if calculated only thence, such an addition, increasing as he admits, can have been "immaterial," whoever may attempt demonstrations to the contrary.

(3) Still more surprising is the blunder fallen into, and which has likewise been already noticed, that because a great majority of the emigrants consist of males, that circumstance "must very greatly reduce "the number from which any increase ought to be calculated[1]." The fact is admitted, and has been acknowledged and recorded by all writers who have adverted to the subject, from Dr. Franklin downwards, and, indeed, long before his time[2]; but, then, the deduction is not only not true, but, as has been so frequently shewn to be the case in the other speculations of our anti-populationists, the very reverse is the plain, obvious, and undeniable fact, as has been acknowledged by the American writers themselves[3]. And how is it possible it should be otherwise? This great majority of males, it follows of necessity, must consist of unmarried males; and it is, furthermore, as certain as common observation and the authority of all writers on the subject can make it, that these unmarried males are principally composed of "young men in the prime of life," who proceed to America, "marry, and settle[4]." Now as, according to the American censuses, there happens to be an excess of females, between the ages of 16 and 26, as Dr. Seybert has

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[1] Ency. Brit., Supplement, vol. vi., p. 310.

[2] Graunt, Obs. on the Bills of Mortality, p. 66. Dr. Franklin, vol. ii., pp. 156, 157. Dr. Price on Reversionary Payments, vol. ii., p. 264. Ibid., p. 333. Warden, Statistical, &c. Account of the United States, vol. ii., p. 249. Dr. Seybert's Statistics, p. 29. Dr. Baxter's American Phil. Transactions, vol. iii., p. 135.

[3] Dr. Drake. Warden, Statistical Account of the United States, vol. ii., p. 249.

[4] See Dr. Franklin, vol. ii., pp. 156, 157, &c. &c.

noticed, in direct allusion to the subject before us, (though, owing to the very nature of the emigration we are considering, so much smaller an excess than in any other country,) and, moreover, while these young men are not, like the Israelites of old, interdicted from taking unto themselves wives of the daughters of the land; nor, in a country represented as an universally marrying one, being very likely to submit voluntarily to the preventive check, from the supposed tyranny of which in Europe they have escaped; what is to hinder them being as prolific as an equal number, taking the entire community together? or, rather, what can prevent them becoming incomparably more so? The passion between the sexes, which, it seems, may be represented as a fixed algebraical quantity[1], will produce its inevitable results between parties thus introduced to each other; or, to express the consequences in the somewhat more striking language of a competent judge in this matter, "They will together;—clubs cannot part them[2]." It is, therefore, quite clear, that a hundred of such emigrants marrying within a year of their arrival, would add more than a hundred times as many weddings, to those annually taking place in the country, as an equal number of individuals taken promiscuously from the entire population, in which, generally speaking, less than one in a hundred annually marry. Every part of the preceding statements is plainly true; but, however modified, it is impossible to evade the conclusion that emigrants, consisting, as they do, of a great majority of males, and those "the most active and vigorous," to avail myself of Dr. Seybert's terms, should be otherwise than far more prolific than an equal number taken indiscriminately from an entire community, inevitably containing a due proportion of that advanced age which has survived the term of prolificness; of that infancy which is far removed from, and in so many cases destined never to attain to, that period ; of that imbecility which is incapacitated for reproduction ; and of that sickness, in all its variety of forms, which, in a great plurality of cases, pushes human beings to the grave long before the natural period of life is fully accomplished. Strange to say, however, it is asserted, that the annual prolificness of a given number of emigrants would not equal that, upon the like amount of individuals, taken indifferently from a community thus constituted: but with an affectation of candour and moderation assumed on these occasions, as previously remarked upon, it is, nevertheless, allowed as a gratuitous concession, that it may be so calculated ; and 3 per cent. per annum is therefore propounded as the accession to both ; whereas it is an increment equally false in both cases, though erring in contrary extremes. Were it a possible ratio, as applied to an entire population, it would multiply it into unsustainable numbers ; but, as the limit of the reproductive principle, calculated on the select and prolific part of it, it would speedily consign the human race to annihilation. The time consumed in exposing such palpable absurdities must, to the plainest apprehension, have appeared already wholly mispent.

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[1] Malthus, Essay on Population, p. 347.

[2] Shakspeare.

(4) Taking, then, 10,000, the number constantly assigned by the writers I am opposing, as the annual amount of American emigration, without, however, for one moment crediting that it at all approaches the real amount ; the next inquiry is, to what extent, on the lowest calculations, such an accession would influence the population of that country. Any exact results are certainly unattainable; but the most moderate compu-

tations that can possibly be adopted, will abundantly suffice to shew the fallacy of the strange but confident assertion, that the very source whence American population solely sprang, and by which it has been perpetually replenished, has, nevertheless, no effect upon its vast and increasing augmentation.

(5) The description of persons, as far as the question of increase is concerned, of these 10,000, at least the proportion of the two sexes, which almost indicates it, I will take from the article in the work I have been latterly referring to: in this it is said, that of 7001 persons arriving in the United States during a given time, 1959 only were females[1], which proportion would give, in 10,000 individuals, 7202 males, and 2798 females, or an excess of the former sex of 4404, who, therefore, cannot any, or, at least, very few of them, be married, and who precisely answer to that description of persons of whom the emigrants are represented as being so generally composed. These, notwithstanding the interdict in the article under notice, would undoubtedly affect American increase; they would marry, and if so, it is plain that, to the extent of this majority, they must of necessity marry American females: we will, however, assign upwards of 400 of them to various accidents and to the operation of the preventive check, or perpetual celibacy; they would then increase by upwards of 4000 the annual weddings of the United States. But we have still 2798 males, and as many

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[1] The above statement gives a smaller proportion of males than I have usually seen, and as such I take it in preference to others equally authentic, as my wish is to avoid exaggerated conclusions. For instance, it is stated, that, in the year 1823, 8170 persons arrived as passengers in the United States, of whom 5243 were men, 1034 women, and 1889 whose sex was not designated, half of whom, on any supposition, must have been males. The number, then, of males was 6188, and of females, 1979, or, calculated on 10,000, the males would be 7575, and the females, 2425; proportions which, if adopted in preference to those in the text, would greatly heighten the conclusions to which the latter lead.

See Journal des Voyages, Sep. 24, 1824, p. 379.

females, to dispose of; and however we may do this consistently with any conjectures at all reasonable, it will not be found to vary the calculation in any considerable degree. If we assume that they consist partly of 1399 married couples, taking out with them two children each, and destined to produce other two in America, one and a half of which latter shall survive to marry, then these couples will of course add in effect to the general prolificness of that country, as already calculated, just one half their number to that of the marriages of the year in which they land, making, therefore, a further addition to the 4000, of 699. It cannot be objected that some of these married couples may die before they have furnished the remaining number of children assigned to them; for such may, and undoubtedly will, be the case respecting the marriages of native Americans; and the prolificness given to them has been already calculated on the general average, including, amongst other considerations, premature mortality. This objection, therefore, and it is the only one which occurs to me as very likely to be made, totally fails. Lastly, we have to estimate the effect of an annual addition of 2798 children upon the foregoing computation. These must be presumed to have almost universally survived the imminent perils of early infancy, before they were carried to so great a distance; the two given in this instance, therefore, will represent a larger proportion of births in each case, as including those who have not survived; if, therefore, we suppose that of these two, one and a half would, on the whole, survive to marry in the adopted country of their parents, we obtain the measure of prolificness already assigned to marriages throughout the United States, and which such a class as the one we are now considering is not likely to fall short of; indeed, emigrants have always been remarked as very prolific, as well as long lived; the latter fact may be attributed to their being a select class, the former, which more concerns the subject, will be partly illustrated hereafter. On these last presumptions, therefore, the children taken out to America would occasion 1049 additional marriages there. In effect, therefore, 10,000 emigrants would cause, at the least, 5478 additional marriages in the United States, and that regularly and annually; for it must be observed, that, as the amount of this annual emigration is given as stationary, the average results would be uniform; the anticipated marriages of the emigrant children of the current year being balanced by the substitution of an equal number belonging to the preceding ones, and any supposed delay in the marriages of some of the single adults being similarly compensated.

(6) The number of annual marriages, during the period fixed upon as that in which these ten thousand have emigrated, *i. e.*, from 1782 to the date of the last census, it will not be difficult to compute, with a precision sufficient for our purpose. The mean number of the inhabitants, during this period, must be first estimated. Warden states them to have been, in 1780, 2,051,000, including the slave population, amounting, at that period, probably to at least half a million[1]. Still, resigning, and to so large an extent, the advantages my argument might fairly claim, I will assume them to have then amounted, exclusively of the latter, to two millions. The free white population of 1790 was, according to Seybert, 3,093,111; the census of 1800 gives the total of the same description of persons at 4,309,656; of 1810, at 5,862,093; and of 1820, at 7,861,710: which five enumerations will give 4,625,314, as the average of the population throughout

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[1] Warden, Statistical, &c. Account of America, vol. iii., p. 229.

the whole term; or, in fact, exceeding it, if the increase were equable during each of the terms, for a reason familiar to the arithmetician; but the difference has not been calculated, as it would be, in this and similar cases, unnecessary to affect so great a degree of precision; and, especially as it would, in most instances, make me appear too scrupulously exact in favour of my own conclusions. I have, therefore, usually declined all such minute advantages in constructing my general proofs.

(7) The utmost probable amount of annual marriages that would take place in this number of inhabitants, may be obtained with as little difficulty, and certainly with exactness sufficient for the purpose in hand. If we fix upon two-and-twenty, as the age at which the males of America marry, and, moreover, make them all to marry, without exception, we shall probably satisfy the advocates of the geometric theory in these respects. Turning, then, to Table LI., at the end of this Book, in which the American census of 1820 is distributed into annual divisions, and, as regularly as I knew how to do it, consistently with the numbers given in its actual divisions, we find that there are, in every 20,000 of the population, 186 males of that age, which would render it barely possible for 1 in $107\frac{5}{10}$ of the entire inhabitants to marry at the period mentioned; a result very different from the suppositions indulged in by Dr. Franklin, and others; of which more hereafter. The mean population, during the period before referred to, being 4,625,314, that number, divided by 107.5, will of course give the annual marriages which can have taken place in America, under the given circumstances: that quotient is 43,026. It may be said, that the proportion of marriages ought to be increased, by adding to the number the second and third ones which

would take place: when it is recollected, however, that our emigrants are quite as likely to form these subsequent connexions as the natives, and that, if the proportion of these be added at all, it must be added to each, the rectification, it will be instantly seen, has nothing to do with the present inquiry, and cannot affect the relative proportions required.

(8) The annual marriages, caused by emigration, being 5748, and those taking place in the native population, being 43,026, it follows that the former are to the latter, as 100 to 748, or rather more than one in 7½, on the whole.

(9) Now, to maintain that an annual addition, in the proportion of 1 in 7½ to the marriages of a community would be immaterial to its growth, is manifestly absurd; but, to suppose that the addition would only augment the regular increase in that proportion, would be equally, though not so obviously, erroneous. The emigrants, compared with the natives, giving so much larger a proportion of their numbers to the reproductive class, and, conversely, augmenting, by a so much smaller one, the non-productive, would alter, and evidently accelerate, the increase on the whole beyond what the addition in question seems, at first, to indicate. As a very little consideration will render this fact perfectly clear; and, more especially, as it is about to be still further proved and illustrated by figures, longer time will not be spent in mere verbal explanations.

(10) I shall now proceed to shew, by means of actual calculation, the necessary effect which a comparatively small accession of marriages has upon the increase of a community at large. And, as I have confined myself to the number of emigrants arbitrarily awarded by our theorists, though it has been distinctly proved, in a former part of this work, how much it falls short of that

warranted and demanded by truth and fact; so, after having made the preceding computation upon that number, I will still (to silence all disputes) recede from them, and present a series of calculations still further within the warranty of truth; it being, as before observed, less the purpose of the present argument to calculate the exact effects of emigration, than to prove that, under the circumstances contemplated, they must be as vast as they are certain.

(11) The construction of the last table in the Third Chapter suggested the subject of this, and furnishes the demonstration which follows. If that table truly express the increase from two couples, year by year, during the whole term it embraces, the increase upon any additional marriages, or proportions of marriages, that may be interpolated therein, may be obtained for any term not exceeding the limits of the period. Thus, commencing in the year 1, and terminating in 206, the two marriages that take place in the first year, have produced, by the last, $180\frac{22}{128}$ descendants; in the year 150, they have given $79\frac{1}{4}$ only; it follows, therefore, that were two marriages added to the table, in the year 56, being similarly prolific, they would, by the year 206, (which gives the like term of 150 years,) have also produced $79\frac{1}{4}$, making the total, at the termination of the table, and in consequence of that addition, $260\frac{35}{128}$, instead of $108\frac{22}{128}$; had the accession been that of one marriage instead of two, the sum total, in the year 206, would have been only half as much augmented, *i. e.* by $39\frac{1}{4}$, and would then have amounted to $220\frac{67}{128}$ only; and so proportionably for any other addition. This method of computing the increase upon any extraneous additions to a population, otherwise advancing by procreation only, it is hoped, is equally clear and incontrovertible.

(12) The following table, having been constructed previously to the preceding calculation, regarding the proportion which 10,000 emigrants would add to American marriages, they were, in two of the columns, taken at a tenth only, and that proportion extended to the entire term, in two different methods, both of which, as will be apparent on the slightest examination, must give results erring greatly in deficiency. The first, which equally distributes the sum of that tenth throughout the whole period, (which is divided into short and equal terms,) evidently falls far short of the relative number of weddings, which must have taken place in consequence of emigration, in the earlier periods of American colonization, and must likewise greatly underrate those which have been added in the later ones, from the same cause; as, if the preceding computations be correct, it would allow only between three and four thousand emigrants as the amount of the annual accessions for the last 44 years. The other, which adds one tenth to every marriage throughout, while it gives so much smaller a part of those accessions which certainly took place in the first periods of American history, still does not come up to the proportion that is allowed, on all hands, to prevail at present, and would give, on the average of the last 44 years, less than 8000 annual emigrations. Both methods, therefore, are necessarily very deficient in representing the results which emigration must certainly have produced on the population; but even that which is the farthest from the reality will give an addition, as will be shortly seen, any thing rather than " immaterial."

(13) But the addition to the marriages of America, as produced by emigration, must be made on a principle dissimilar to both the preceding ones, in order

to manifest and confirm the real fact regarding these accessions. If we fix upon so low a proportion as one tenth of the marriages as produced by these foreign additions at the present time; which, as has been before observed, supposes them to amount to less than 8000 annually, (I perceive I have given $\frac{1}{11}$ only in one of the columns in the last three sections of the ensuing table,) the farther we trace back the history of the colonies, the smaller is their population, and the proportion of emigrant marriages must consequently greatly enlarge, till at length we arrive at a period, when nearly all of them must have been thus occasioned, and finally the whole of them, literally speaking, were the union of parties born elsewhere. In conformity with this undeniable fact, I have, therefore, lastly calculated the effect of an addition of emigrant marriages, regulated on this principle, commencing with as low a proportion as $\frac{1}{11}$ part of the whole, and continuing that backwards for three sections, and afterwards for two successive sections each, increasing it to $\frac{1}{10}$, $\frac{1}{9}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, and in the first two, adding an equal number. I am not so sure that this may not overrate the proportion of marriages thus occasioned, in some periods of the table, as I am that in others, and particularly in the beginning and end of the whole term, that proportion is greatly underrated; but, again disclaiming any pretence to scrupulous exactness on this occasion, this method also will exemplify, and perhaps more correctly than the others, the effect emigration has unquestionably had upon American population; as it is evidently calculated on a principle more consistent with its history. I have only further to remark, that should the demonstrators of the geometric theory select short periods from any of these calculations, and especially from that last mentioned, by which to shew these accessions as immaterial, I shall not only rebut the induction, by repeating what has been already advanced in proof of the erroneousness of such a method, but retract all that has been allowed, for the sake of argument, respecting the limited extent of emigration, and demand, as I am fully warranted in doing, for years together, many times the amount at which it has been stated.

(14) The ensuing table, calculated on the basis of the last in the Third Chapter, presents, in the first column, equal divisions of nine years each, excepting the last, which has eight only: the second, the middle year of each, which, deducted from 206, the last date in the table, gives, of course, the remaining years, during which the increase on any additions that are to be made to the marriages must be calculated; and the terms, thus obtained, appear in the third column. In the fourth are given, in their respective terms, the actual marriages which occur in the before mentioned table, as resulting from the two original couples. In the fifth, is found the increase on those marriages, according to the same table, for a period equal to the term expressed in the third column, and which constantly extends to the end of the calculation. In the sixth column are placed the fractional proportions of the marriages arising from emigration, compared with the rest; commencing, as before explained, with the supposition of their being equal, and of their diminishing, till, at the termination, they are abated to $\frac{1}{11}$, which proportions are reduced in the seventh column to actual numbers. In the eighth, is the increase upon these additions, computed, for the terms specified, according to the table. In the ninth column, a less addition is made to the marriages,

amounting, on the whole, to only one tenth part of the entire number; and this addition is equally distributed throughout the several divisions, without any reference to the marriages that otherwise take place in each—the proportion in the last being reduced so as to correspond with its shorter duration. The tenth column gives the effect of such accessions on the natural increase. The eleventh column makes only the same total addition to the marriages, as the former, but does so by increasing, by $\frac{1}{10}$, the number of marriages as they occur in the table. The twelfth, and last, gives the results of this method also.

TABLE XXIII.

NG THE EFFECT OF EMIGRATION ON THE NATURAL INCREASE OF
ULATION, ACCORDING TO DIFFERENT METHODS OF CALCULATION.

Remaining Years.	Marriage in each Term.	Increase on 2 Couples in the remaining Yrs. according to Table.	Proportional addition of Marriages.	Numerical addition of Marriages from the last Column.	Increase on the addition of the last Column.	Addition of tenth of the total No. of Marriages equally distributed	Increase on the addition of the last Column.	Addition of one tenth of the Marriages proportionably distributed.	Increase on the addition of the last Column.
201	2.	168.601	$\frac{1}{1}$	2.	168.601	.428	36.080	.2	16.860
192	—	—	$\frac{1}{1}$	—	—	.428	29.160	—	—
183	1.	124.828	$\frac{7}{8}$	.875	54.612	.428	26.713	.1	6.241
174	2.	112.359	$\frac{7}{8}$	1.75	98.314	.428	24.050	.2	11.236
165	—	—	$\frac{3}{4}$	—	—	.428	19.748	—	—
156	1.5	83.062	$\frac{3}{4}$	1.125	46.722	.428	17.775	.15	6.229
147	3.	77.844	$\frac{5}{8}$	1.875	72.978	.428	16.658	.3	11.676
138	—	—	$\frac{5}{8}$	—	—	.428	13.081	—	—
129	2.5	54.188	$\frac{1}{2}$	1.25	33.867	.428	11.596	·25	6.773
120	3.25	55.125	$\frac{1}{2}$	1.625	44.789	.428	11.797	.325	8.957
111	1.125	40.125	$\frac{3}{8}$	.422	8.466	.428	8.586	.1125	2.257
102	3.25	35.5	$\frac{3}{8}$	1.218	21.619	.428	7.597	.325	5.769
93	4.875	38.	$\frac{1}{4}$	1.219	23.161	.428	8.132	.4875	9.262
84	2.25	26.5	$\frac{1}{4}$	.562	4.891	.428	5.671	.225	2.981
75	3.4375	22.75	$\frac{1}{8}$	.430	13.555	.428	4.868	.3437	3.910
66	8.1875	26.5	$\frac{1}{8}$	1.023	7.496	.428	5.671	.8188	10.848
57	4.	18.5	$\frac{1}{9}$	.444	4.107	.428	3.959	.4	3.7
48	4.4375	15.	$\frac{1}{9}$	.493	3.697	.428	3.210	.4437	3.328
39	12.1095	18.	$\frac{1}{10}$	1.211	10.899	.428	3.852	1.211	10.898
30	5.953	13.	$\frac{1}{10}$	.595	3.868	.428	2.782	.2953	3.869
21	7.906	10.	$\frac{1}{11}$	.719	3.595	.428	2.140	.7906	3.953
12	15.422	10.	$\frac{1}{11}$	1.434	7.170	.428	2.140	1.5773	7.887
4½	9.422	8.	$\frac{1}{11}$	.857	3.428	.381	1.140	.9422	3.769
	97.976			*21.127*	*635.635*	9.797	266.406	9.797	140.403

(15) To apply the preceding calculations to the use for which they were made; and to commence with the last, and, as it respects increase, the least favourable computation. Few, it is presumed, after what has been advanced, will assert that only one tenth part of the marriages of the United States are occasioned by emigration, at present; most certainly there are none who can suppose such was the case upwards of 200 years ago. But, one-tenth added to the number of marriages which occur in the table, as resulting from natural generation, and, in a manner which necessarily renders them the least productive, instead of increasing the number in existence at the end of the term by one tenth only, makes upwards of seven-fold that addition. The $97\frac{976}{1000}$ marriages which have occurred between the years 1 and 206, give, at the latter period, $180\frac{773}{1000}$ persons as in actual existence; $9\frac{797}{1000}$ extra marriages added, as explained, produce by that time, $140\frac{403}{1000}$, which, added to the former, make $321\frac{176}{1000}$. Even this evidently deficient computation proves, then, that emigration is "immaterial" to American increase, just so far as the difference between the numbers 180 and 321 may be so regarded.

(16) But the addition of this tenth, as given in the 10th column, is more conformable to the fact to be illustrated, though it will be still inadequate to present the result in its proper magnitude. Its effect, so calculated, is to add to the same $180\frac{773}{1000}$ persons, who, as before stated, were the product of internal generation only, during the term in question, other $266\frac{406}{1000}$, making the total $447\frac{179}{1000}$, or, between two and three times the natural amount of the population. According to this second method of computation, then, which is still, evidently, far within the truth in all respects, is emigration "immaterial"?

(17) Lastly, the effect, according to the 8th column, of an emigration which would add, during the 206 years, $21\frac{117}{1000}$ marriages, to the $97\frac{976}{1000}$ which take place independently of it, and at the intervals and in the proportions already explained, would be that of raising the population from $180\frac{113}{1000}$, the number produced by "procreation only," to $816\frac{408}{1000}$; or, between four and five-fold: and, even in this last computation, the interpolated marriages, as referrible to American statistics, are manifestly too few, in some of the first, and in several of the last, sections, whatever may be the case respecting those in the intermediate ones.

(18) It is on the whole, therefore, quite clear that it would be easy enough to make such additions to the marriages in the table of natural increase, as given in the preceding chapter, as would, very accurately, double its numbers every twenty-five years; that such additions would not be required to be large; though, compared with those in the preceding table, they would have to be increased somewhat in a few of the last sections, which would certainly render them more consistent with the existing facts, in relation to America: but I shall pursue these computations no further, as, in the cavils that might be raised, about some of the facts which must be then distinctly advanced, the main design of the present argument might, in some measure, be lost sight of, which is, to demonstrate that comparatively small constant accessions to the population of a country have an effect upon its increase to an extent which could not be imagined, and, certainly, would not be credited, without their being demonstrated by actual calculation: and this, it is hoped, has now been satisfactorily done.

(19) Nothing then can be clearer than the conclusions suggested by the connected results of this and

the preceding chapter, or more fatal to the principl opposed throughout. The sole demonstration advance in proof of the existence of the geometric theory, even i its slowest ratio of increase, is avowedly derived fro the progress of American population. That increase, a stated to us, may, under certain necessary limitations already adverted to in a preceding part of this work, b taken as substantially correct; but whether it be almos wholly the result of internal generation, or greatl accelerated by external accessions, has been the sol question: and one which, it is hoped, is now finall answered. It has been demonstrated in the las chapter, as irrefragably as arithmetic can demonstrat any thing, that the very measure of prolificness assumed in behalf of American marriages, for the specia purpose of proving the duplication contended for, a resulting from internal procreation only, would fal short of producing that effect, not by a slight deficiency, which it would have been unworthy of a wor of this general nature to have noticed, but, in a coupl of centuries only, in the overwhelming proportion o more than fifteen to one. That there is no possibility consistently with the laws of Nature, of amending th calculation of that prolificness, so as to combine th ratio of American increase with the hypothesis that i proceeds from propagation only, is manifest: equall so is it, that there is only one remaining method o reconciling these otherwise discordant results; but, i is one which does so, clearly and adequately—it is b adverting to the fact, and its necessary consequences which are known and proved to exist, and to hav existed, and to the extent required, on the authorit of every species of evidence of which the subject i susceptible, namely,—Emigration.

(20) Dr. Johnson, I think, observes, that the wor

material," is often used in a sense in which it ought to be rejected; at all events, I hope I may conclude the examination which has been the subject of the present chapter, by expressing a persuasion that both the word, and the sense in which it is applied, will, in future, be discarded, in discussing the effect of emigration on the progress, past or present, of the population of America.

CHAPTER VII.

OF THE POSSIBLE PROPORTION OF MARRIAGES IN DIFFERENT COMMUNITIES.

(1) THE main agent, which, in the geometric theory of population according to its advocates, has, to the exclusion of emigration, to reconcile the wide differences which exist in the increase of various countries, is what is now called the "preventive check;" but the powers with which it is invested, are amply sufficient, were they real, to produce all such results, and still more astonishing ones; but, alas! the limits assigned for its operation involve impossibilities, still to repeat a term which cannot be well substituted, but which begins, I fear, to sound like tautology; I proceed, however, to justify its repetition, as applied to this part also of the system under examination.

(2) Previously to pointing out the essential error in the method by which the comparative prevalence of this check is at present supposed to be ascertained, I shall spend a few words (and many will not be required) in shewing the egregious mistake into which these writers have fallen regarding the possible number of marriages in different communities, and from which, they of course suppose they establish the existence, and calculate the effects, of the great regulator of their system. Now, without attending for the present to those particulars, which, it will be hereafter seen, limit the proportion, we will only state, that the utmost number of annual marriages (first ones, at least) which may take place in any community, cannot possibly exceed the number of those of

its males who annually arrive at the age of puberty, and who are not naturally or accidentally incapacitated from forming that union. The proportion these bear to the whole, which cannot vary greatly in the population of an entire country, will evidently indicate the result required. Plain and necessary as this method of determining the question appears, it has been totally lost sight of by our writers on the subject. Political economists, while building up their theory, have as little ceremony in contradicting the plainest rules of arithmetic, as in outraging the feelings, and insulting the common sense of mankind.

(3) To present a few proofs of these assertions, Mr. Malthus, with great apparent moderation, says, "it "may fairly be said, that not more than one half of the "prolific power is called into action in this country;" and he proves it thus, that "if all were to marry at 20, "which is by no means so early an age as possible, "—there would be one annual marriage out of 60 persons, instead of one marriage out of 123 persons, "as is the case at present[1]."

(4) Dr. Franklin is, as we have already seen, a little more sanguine on the subject, and but a little. "If," says he, "it is reckoned there" (in Europe) "that there "is but one marriage per annum among 100 persons, "perhaps we may here reckon two[2]." And he likewise makes his calculations accordingly.

(5) But the American writers, taught by the "philosophers of Europe," are not now satisfied even with these proportions. Mr. Warden, who runs into the grossest absurdities whenever national vanity prompts him, positively asserts, that instead of one marriage in 120, the estimated proportion in Europe, in the United States the marriages are as 1 to 30, the births 1 to

[1] Malthus, Essay on Population, p. 304. [2] Dr. Franklin, Works, vol. ii., p. 385.

20[1]. No marvel that he gives us the population of his country, for 1925, as amounting to 224 millions!

(6) To begin with the last authority. How has it been possible that a writer, having apparently so much to do with figures and calculations, should have overlooked the glaring absurdity of his own statement? Wonderfully gifted as that population is represented to be, it is, nevertheless, presumed that it still requires two individuals there to form one marriage; and if so, Mr. Warden gravely assures his readers, and by plain figures, that, in his country, there is annually one person married in every fifteen, though, according to the prolificness he attributes to it, (and he is, in this respect, quite liberal enough,) there is only 1 in 20 born;—one-fourth more individuals married yearly than there are births! The absurdity does not require heightening, and, indeed, hardly admits of it; otherwise, as it is again presumed, respecting America, that the marriages and the births of the same year are not contemporary in point of age, but that the former must be the union of those born, at least, as far back as the distance between birth and puberty; and if, at that distance of time, the population, and, consequently, the births, were only half as numerous, and, as it is calculated, that only two-thirds of the born survive to be married, even there[2], it follows, according to Mr. Warden, that, in the United States, there are three times as many individuals at length married, as were born, and four times as many as can annually attain the age of puberty[3].

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[1] Warden, Statistical, &c. Illustrations of the United States, vol. iii., p. 231.

[2] Malthus, Essay on Population, vol. i., p. 484.

[3] To give a numerical exemplification of this extraordinary mistake. Let 300 stand for the population of the United States in 1795, which, doubling every 25 years, would have increased, in 1820, to 600: and let 25, merely for the purpose of illustration, be the nubile period. In the former year there would be, according to Mr. Warden, 15 births; and less than two-thirds of these would, according to Mr. Malthus, live to marry: in 1820, therefore, the births of 1795

(7) Dr. Franklin's "reckoning," that one marriage in fifty takes place in America, might be refuted by referring to Table XX., in the Third Chapter of this Book[1], constructed on his own data; but a readier method of disproof presents itself. Supposing the whole of the males to marry there, on attaining their twentieth year, the period he has fixed upon, I find the proportion of these, according to Table LI., at the end of this Book, would be 204 in 20,000, rendering it not quite possible for one marriage to take place in every 98. But if this method of calculation is unsatisfactory, another presents itself, not liable to objection. There is a division in the last American census, which, for what purpose soever made, will answer mine on this occasion; that which gives the number of males, between the ages of 16 and 18; in this biennial section, these amount to 182,205. Taking one half this number, for one year's proportion, and dividing the entire white population, amounting to 7,861,710, by it, the quotient will give the utmost possible number of annual marriages which could take place in America, were all the males (men they cannot be called) to marry at the mean age, 17; and that proportion is not quite 1 in 86. Little, it is conceived, will be said about the operation of the preventive check in such a case.

(8) But it is to Mr. Malthus's assertion, respecting our own country, that the reader's most serious attention is demanded, as the basis upon which his denunciatory system takes its stand; pronouncing the evils treasured up for mankind, by the principle of popula-

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could only give 5 marriages, were all to marry. But Mr. Warden assures us that, in the population of the latter period, there would be 30 births, and 20 marriages; in other words, that the 15 born 25 years before, would multiply into 40, in order to form 20 couples; in short, calculating the deaths, just 4 times as many are said to marry as is possible!

[1] Page 33.

tion, to be as vast as they are imminent, and which are only, in the mean time, restrained by the "preventive check," which, however disguised, is practically as cruel, as it is, in principle, disgusting. "It "may fairly be said," are the words of this writer, "that "not more than one half of the prolific power is "called into action in this country;" founding, on a ridiculous supposition, an impossible one, namely, that were all to marry at 20, there would be one annual marriage in every 60, instead of 1 in 120, as at present. Turning to Table XLVIII., at the conclusion of this Book, in which the population of England, as divided into ages in the last census, is again distributed into annual divisions, and so done, I think, as not to admit of material error, (certainly none that can affect the present inquiry,) we find the number of those males who have arrived at the age of 20, are, in every 20,000 inhabitants, 173; were all these, therefore, to marry in that year of their life, as predicated in the supposition under consideration, not quite one marriage in 116 could possibly take place, at least, first marriages; and it would match the absurdity I am exposing, to attend, in this case, to the minute effect which subsequent ones would have on this proportion; in fact, the supposition is precisely of the same character as that of Mr. Warden, though advanced for so very opposite a purpose; and it may be similarly disposed of. It requires here, also, two individuals to form one marriage; consequently 1 marriage in 60 implies two married persons in that number, or 1 in every 30 of the inhabitants; but, if we may trust the population-abstracts, there is only one birth in every 35: there must, therefore, be, according to Mr. Malthus, one seventh more persons annually married in England, than are annually born, were it not for this "preventive check." But if we again go back (and we must do so in this inquiry) to the period when those contracting these annual marriages were themselves born, and recollect that in England, also, population has considerably advanced, and that here, likewise, Death makes his ravages, as elsewhere, between the natal and nubile periods of life, the absurdity will, if possible, appear still more glaring. Thus, by the published censuses, we find that the births of 1800 were 227,093, of which 112,081 were females; and, had all the latter married in 1820, the population then being 11,261,437, it is evident not quite one marriage in every 100 could have possibly taken place: or if Mr. Malthus means to say, that but for the operation of the preventive check, the males would all marry at 20, and seek wives of a still earlier age, then it will be found that, as the male births in 1800 were 115,012, about one marriage in every 98 could have taken place in 1820, that is, had no deaths occurred amongst the number of those born in 1800; but admitting Death into the calculation, (for he will be so admitted in spite of our political arithmeticians,) and the supposition of Mr. Malthus will then only appear in its just proportions, as an absurdity that nothing can heighten.

(9) Certain, however, that the advocates of the system I am opposing will attempt to maintain the preventive check, as their sole weapon, whether for offensive or defensive operations, and that all exceptions will be taken against every species of proof that shall shew its comparative non-efficiency; and that, in this instance, the exactness of the registers of the births may, probably, be made the ground of an objection against the foregoing conclusions, however little any imaginable rectification of them would serve their

turn, I will pursue this important inquiry by another method, which will lead to a similar result. Before doing so, however, I shall anticipate, and obviate, an objection which may, perhaps, be made on the ground that the increased degree of prolificness which this liberation from the supposed operation of the preventive check would occasion, might have the effect of greatly augmenting the proportion of marriages. Those who imagine that such an alteration would have that effect, the physical laws of nature remaining as at present, are mistaken; the positive results would, were such suppositions possibilities, greatly vary, without any corresponding variation in the relative ones, which are, at present, the sole subject of consideration. This, however, as a matter of mere calculation, has been already demonstrated: if the reader will refer to Table XX., in the Third Chapter of this Book[1], where Dr. Franklin's hypothesis is carried out upwards of two centuries, he will find that the proportion of marriages is not nearly so large as the smallest I have yet mentioned; and even if his suppositions in favour of America should not be deemed sufficiently liberal, those in the first table of the preceding chapter will, undoubtedly, be thought so, where all marry at twenty, and all the married have ten children, out of fifteen, who survive to marry; but, even then, as is shewn in the second table[2] of the same chapter, only 1 annual marriage in 108 could possibly take place.

(10) To revert, then, to another, and a last numerical proof of the nature of Mr. Malthus's hypothesis, that of one marriage out of every sixty inhabitants in this country. Admitting that the registers of births may be defective, (though not to a degree that could at all affect the present dispute,) there is, in the last

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[1] Page 33.

[2] Table XVII., p. 17.

census, information of another kind inserted, and not liable to a similar objection; the ages of the inhabitants, at least a great proportion of them, were obtained, and they are there classed accordingly: and, as it would be unreasonable to doubt but that, as far as they go, the results are substantially accurate, they are, for all purposes of comparison, as satisfactory as though the entire number had been so given. The sum of the persons thus entered, in 1820, was 9,830,461. To revert, then, to the first and infant division; the females, under five, amounted to 725,202, the mean annual number being 145,040$\frac{4}{10}$; and supposing, in favour of the hypothesis under consideration, every one of these had that year become a bride, at the average age of two-and-a-half years, still, not 1 marriage in 68 could have taken place. But the author alluded to nevertheless anticipates, very nearly, this result, should population receive due encouragement. "Till the "proportion of the marriages," he elsewhere says, "rises from 1 in 123" (that which then prevailed) "to 1 in 80, or 1 in 70, it cannot be said that the "towns draw hard upon the country for population[1]." The draught would, indeed, be most extraordinary, notwithstanding that his advocacy of the preventive check, and the principle of population dependent upon it, require him to treat it as so natural a possibility; for it would require, on the latter supposition, every female infant of six and under to marry at that age; and even on the former one, the nubile period must be limited to the eleventh year, at the latest, and commencing at the first, in which all in existence must marry to make up the proportion. I call upon this writer, therefore, either to prove the possibility of his assertions, or to withdraw them; not in a tacit and unnoticeable manner, but openly and honestly, as the cause of truth, and the interests of human nature, deeply involved in the important question, imperiously demand. He has ridiculed M. Muret, for supposing the interference of the Deity, on an occasion where it is difficult to believe in his existence, and impossible to credit his providence; if we suppose he would not interfere, namely, in adjusting the numbers of his offspring to his provision for them: and still, in behalf of his own system, he "betakes himself to miracles" indeed. The suppositions regarding matrimony, if unchecked, imply, either that the laws of mortality shall be totally suspended, or that, as human beings grow up to maturity, they shall become androgynous: one or the other is necessary to realize his often-repeated assertions regarding the number of marriages which would take place, except for the intermeddling of his preventive check.

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[1] Malthus, Essay on Population, p. 315.

(11) No notice has been taken, in these calculations, of second and third marriages, and none has been hitherto required: it would, indeed, have been ridiculous to apply such comparatively minute rectifications to results which would still have remained a series of absurdities. When the argument is reduced within the limits of possibility and truth, their proportion will be duly attended to, and form a part of the computation.

(12) Such, then, are the great and fundamental errors of the system I am opposing—errors of a magnitude which no explanations whatsoever can reconcile to reality, and which the simplest examination serves to expose. Can mere confidence of assertion continue to impose it upon mankind, or ingenuity protect it from the fate it merits? In a word, I would ask, in the language of Shakspeare, "What trick, what

"device, what starting-hole, can hide it from open and "apparent shame?"

(13) But, alas! its shame, after all, is not that arising from miscalculation, however great. It consists in this, that it has eagerly, and on such grounds as these, impugned the ancient and permanent sense of mankind, outraged the holiest feelings of human nature, and arraigned the wisdom of the providence of God; attempting to establish, on behalf of the rich and the powerful ones of the earth, a monopoly of his common benefits, and insulting Him in the person of those whom all religion, natural or revealed, has invested with his jealous protection,—the poor and the destitute, to whom it has dared to deny the claim to the smallest portion of food, and even the right of existence itself.

CHAPTER VIII.

OF THE METHOD OF CALCULATING THE PREVALENCE OF THE PREVENTIVE CHECK.

(1) SOME of the grosser errors only, in relation to the preventive check, have as yet been examined; there still remain mistakes to be pointed out, in the usual method of estimating its prevalence, quite as fatal to the theory under examination, though of a less flagrant character. And in order to do this, the question already negatively discussed in the last chapter must be resumed, with a view to its actual determination: the possible number of marriages in a community wholly uninfluenced by this often-mentioned restraint must evidently be ascertained, before its existence can be inferred, or its comparative influence estimated.

(2) The utmost number of annual marriages (first ones, at least) that can regularly take place in any community, is obviously limited by the number of its males who yearly arrive at the age capable of forming that connexion, and not physically incapacitated from so doing. When the actual falls short of that possible number, it argues, that in so many instances the marriage union has either been finally prevented, or postponed; and the latter case will become the former one, in proportion to the length of the interval and the corresponding mortality that takes place in it: the other effects of such postponement have been greatly misapprehended, as remains to be shewn. Now, as during the whole term of life, every succeeding year diminishes the number of persons in existence in any community, compared with those in the preceding one,

so the effect of advancing the age of marriage, were all the living at the later period still to marry, would be to lessen the possible number by the amount of that difference. Whenever, therefore, the annual number of first marriages equals that of the males who attain yearly the marriageable age, not being naturally incapable of that connexion, the preventive check, as it is called, has evidently no existence; but when the former number falls short of the latter, it must be supposed to operate, but only to the degree indicated by that deficiency, and in the manner already mentioned.

(3) The utmost possible number of marriages depending thus on the earliest possible period at which that union can take place, the latter has first to be ascertained. And here it must be observed that this possible period, considered physically and morally, is not identical. In this respect the human race, at least in every state at all approaching to civilization, differs from the brute creation. Under the supposition of the preventive check having no existence whatsoever, feelings inherent in mankind, and which are clearly ingrafted there by the great Author of nature, as conducive to health, virtue, and affection, fix infallibly the nubile period somewhat in advance of that of puberty, and especially as it regards the male sex. This interval will vary, according to the different feelings and circumstances of individuals, but its average duration must be added to the period of the physical possibility before alluded to, in order to determine the moral one; or, in other words, the earliest age at which the males of a community, totally unshackled by any unnatural restraints, would, on the average, marry. This first determined, the census of any country in which the population is divided into sexes, and these again distributed into their several ages, will give, of course,

the actual number of the males, of the age fixed upon, which number will present the gross limitation of that of the marriages of the year; and in a community, the movements of whose population are regular, the same rule applying generally, the proportions of the present year will be those of past or succeeding ones.

(4) But, from this gross number, certain deductions are necessary, in order to reduce it within the limits of possibility; being those exceptions which the laws of nature and the condition of humanity invariably make. These, still supposing the total absence of the preventive check, consist of such as sickness, for the time being, must prevent from entering into the marriage state, and the number of these is in some degree indicated by the mortality taking place at the period; of those who, in the most prosperous state of society, would, in the active periods of life, be withdrawing from it in pursuit of various and distant avocations; of those whom fixed disinclination deters from forming matrimonial engagements; and, lastly, of those whom permanent imbecility, whether of mind or body, disables from doing so. It is more difficult to determine in what proportion the latter exception occurs than the former and more important ones, though its existence is undoubted[1].

(5) But in order to arrive at correct results, (the hope of doing which is the great encouragement of the writer in his present somewhat laborious undertaking,) a rectification of a contrary tendency must be made in the calculation, and one, in most cases, far more than balancing the preceding ones. Hitherto, first marriages alone have been alluded to; but, in the whole number of matrimonial connexions, it is evident that a certain part consists of second and subsequent

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[1] See Matthew, ch. xix., v. 12.

ones; and it is equally clear that these make so many additions to those which take place in the earliest possible period; which latter, in the very nature of things, must be first weddings. A due allowance, therefore, must be made for other than first connexions, before the difference between the actual and possible number of marriages can be estimated, which difference constitutes the essence, and measures the extent, of the preventive check.

(6) Such appears to be the certain, and not very intricate method of determining the question before us, in relation to those countries where the annual marriages are correctly ascertained, and the population enumerated and classed according to their respective ages. Before applying it, I am convinced that the "preventive check" will be found to prevail far less in every country that presents the facts necessary to the examination, than has been represented, and least of all, probably, in England, owing to the general prosperity which, comparatively speaking, this country has long enjoyed. And, if the reader reflects that the habits of the great mass of the community alone determine this point, his own information, derived from general observation, will, most probably, have already convinced him of this fact, and have rendered the subsequent calculations superfluous. And I cannot but remark here, that, were it otherwise, the complaints of the "early and improvident marriages of the poor," with which the bench of justice too often rings, and the press teems, would be gratuitous and unpardonable insults. These accusations, however, are constantly suspended whenever the geometric theory has to be supported; on such occasions, the most forward in making them can turn round and assert, that even "in this country not more than one half of the prolific

"power of nature is called into action[1]." Less hesitation is necessary in controverting the positions of a theory whose advocates thus incessantly contradict themselves, as well as each other.

(7) I shall now proceed to estimate the prevalence of the preventive check in England; an inquiry of the first importance, not only in reference to our own feelings and interests, but to the general argument; in as much as the number of its inhabitants, in proportion to its extent, demands, according to our antipopulationists, the presence of this, their supposed great regulator of the otherwise redundant numbers of mankind, while the slower rate at which its inhabitants increase, compared with other countries to which they are perpetually adverting, proves, according to their method of reasoning, the great extent to which it prevails. I have, therefore, first, to calculate the possible proportion of annual marriages that could take place in England, agreeably to the method laid down; not, indeed, affecting minute exactness, which, with our present limited information in statistics, is, unfortunately, unattainable; but, nevertheless, indulging a hope that the approximation will not be very remote from the truth, and may lead to those further inquiries which will invest the subject with certainty and precision.

(8) After much, and, I trust, unbiassed consideration, I assume 23 as the age at which the males of this country (whose population is happily distinguished for its longevity, and by consequence for a longer term previously to puberty than most others) would marry, were none of the obstacles interposed, which are comprehended under the general appellation of the preventive check. In so doing I anticipate, by several years, the actual period, as pronounced by our theorists, and, indeed,

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[1] Malthus, Essay on Population, p. 303.

adopt that which, as Mr. Warden boasts, prevails in the early-marrying state of New York. I cannot apprehend that many will accuse me of having protracted this date in favour of my argument; but, I believe, some will think I have unnaturally anticipated it; and if so, I have again conceded too much to the system I oppose. To the latter, however, I would remark, that, in the numerous and very populous manufacturing districts of this country, premature marriages are exceedingly prevalent; premature in every sense of the word, whether in reference to decency, affection, or health. Amongst the many disgusting and demoralizing effects which a mercenary system is rapidly introducing amongst us, that of making labourers of mere infants is the foremost, by which an additional inducement is held out to sexual intercourse, too often destructive of early virtue, anticipating the period of manhood, and, consequently, dispensing with the settled affection which is only fully developed at that period. Favourable as I am on every account to early marriages, yet I would stigmatize immature ones, especially those which, neither preceded by affection, nor sanctified by virtue, reverse the order of Nature, and displace the holiest feelings of the heart, by such as can never disgrace the brute creation, when the parent looks to his child for support in idleness and dissipation, actually contemplating its slavery in its propagation. This is a matter which demands, and shall have, further animadversion; in the mean time, this sordid motive, added to the sufficient inducements to marriage, which Nature supplies, operating on so large a mass of the community, may, probably, be the means of antedating the proper nubile period in England, in as many instances as considerations deemed prudential are the means of somewhat retarding it in others. But I am rather anticipating my argument, in thus shewing that the mean age at which the males of this country, generally speaking, now marry, is, probably, not very distant from that which Nature, properly regulated, would dictate, were she the sole arbitress. To return, therefore: in fixing upon 23, for the average nubile period of the males of England, as that which would probably result from the combined operation of physical and moral causes in the total absence of the "preventive check," I have not intentionally erred, nor does the argument require that I should do so.

(9) I must now again turn to Table XLVIII. at the end of this Book, which, once for all, I must beg the reader to examine, in reference to the fairness of the principle upon which it is constructed, and the certainty of the facts which it exhibits, founded, as they are, on actual enumeration, and so far, perhaps, differing from the various results obtained by the different formulas of our theorists. Neither the one now referred to, nor the others of a similar kind, were constructed to serve any particular argument, and, least of all, the present one, which was not in contemplation when they were formed. Intentional errors, then, are out of the question; and the limits strictly imposed by the recorded particulars of each census have rendered any material mistakes almost impossible, and this call upon the reader's confidence, consequently, superfluous. In the table, the proportion of the males, of 23 years of age, in the population of England, enumerated as before explained, is 150 in every 20,000. That every one of this, or of any other age, in an entire community, should marry, is palpably impossible. The exceptions, already adverted to, have to be deducted before it is possible to ascertain the utmost number that can do so; and, of these, the only ones that will

be attended to, at present, are the proportionate number of those that are sick, or on the point of withdrawing from the country, at the period in question.

(10) In a stationary population, the difference between the numbers existing in their 23rd, and those in their 24th, year, would be the amount of those who had either died or withdrawn from the country, during the interval; which difference might be transferred, and, perhaps with some increase, to the year preceding: this, in that division of the table, is 7 out of the 150. But the population of this country is not stationary; on the contrary, it advances, apparently, after the rate of $1\frac{1}{2}$ per centum yearly: this ratio has, therefore, to be first deducted, and it reduces the 7 into $4\frac{75}{100}$, which latter sum, if correct, is that of the deaths and removals which have occurred during the year in question. Now it is as superfluous to remark that deaths are occurring at every time of life, as that the removals constantly taking place in the most active period of it, especially in this enterprising country, are even still more numerous. Quite as manifest is it that the sicknesses which terminate in death, and the anticipations which precede expatriation, must spread over a considerable proportion of the interval, rendering marriage, in such cases, at least in most of them, impracticable.

(11) First, as to the proportion of mortality: this our actuaries, who have written so very much, and collected so exceedingly little, have still left very doubtful; some of them, I am convinced, have grossly misled the public mind. Turning to the French tables, almost the only ones recently constructed, applicable to an entire country, I find, that in the number, and at the age specified, without, however, distinction of sexes, it would be nearly two deaths in every 150 individuals of the age of 23: other calculations give the proportion

somewhat less; great precision, however, in this instance, is not of much importance; the question is not how many enter the house of death at this period, but the number, which I do not mean to exaggerate, of those that are brought to the gates of it, and the time they linger there, so as totally to prevent the marriage union, without the introduction of the preventive check. It hardly need be remarked, that this latter number must exceed that of the mortality. Turning to certain medical reports of the British army, a select class, from the first, in regard to healthiness, and kept so, by constant discharges, with that view, and consisting of men "whose average age is decidedly under 30," I find, that there were on the years 1823 and 1824, about 4½ per centum of the whole number, on the sick lists, which, being returned by medical officers, are not very liable to falsification[1]. By other official reports in my possession, it appears that, even in Ireland, for 23 years together, namely, from the year 1797 to 1819, the mortality in the military establishment of that country was only one-third of the before-mentioned proportion of sickness[2]. To revert, then, to the subject before us: if in every 150 of the age of 23, the cases of annual mortality would be nearly two, how many would be those in which illness would necessarily prevent the marriage union?

(12) The next inquiry relates to the proportion of those who at the same period leave the country, and the effect their anticipated absence has upon the number of marriages that can take place in it; and when we consider the magnitude, population, and wealth of our foreign possessions, which induce so many of our ambitious or enterprising countrymen to repair

[1] Report on the Laws respecting Friendly Societies, pp. 139, 140.

[2] Drs. Barker and Cheyne. Account of the Fever in Ireland, vol. i, p. 78.

to them in their youth; and recollect that their custody demands so large a military force composed of males principally of an early age also; and that we have a large marine on every foreign station; the difficulty will not be in making up the amount of the exceptions mentioned, but in not exceeding it. I still mean exceptions which are no evidences of want and necessity, but rather of great and growing wealth; and which are no more referrible to the "preventive check," than the invasion of India by Alexander the Great, or the naval discovery of that country by the heroes of the Lusiad.

(13) If, therefore, on the whole, we assume that in the nubile year fixed upon, those prevented from marrying on account of disease will only equal the number of those that will be "sick unto death," during its continuance; and that a not much larger proportion will be deterred from entering into that connexion by the prospect of their early departure from the country; we may deduct the difference already mentioned, $4\frac{15}{100}$, from the 150; leaving the $145\frac{85}{100}$ as the utmost possible proportion that can marry, in the number and at the age specified.

(14) Little apprehension is entertained that the amount of these exceptions will be objected to as exaggerated. On the contrary, it is quite evident that others, of a somewhat different character, already alluded to, ought to have been calculated and added to the foregoing ones. Independently of a variety of peculiar hinderances, there must be some in the active portion of every community, whom temporary absence or unforeseen accidents would compel to defer this union; some (excepting in the savage tribes, where, we are told, such are made away with) whom long and incurable disorders would render unfit for it; some,

whom permanent disinclination, or incapacity, whether mental or bodily, would prevent entering into it;—these, "and a thousand natural shocks that flesh is heir to," neither to be anticipated nor eluded, none of which have any thing more to do with the "preventive check," than the phases of the moon, exist, and will continue to exist, whether omitted in our calculations or not, in every rank, and in any future state of society which can be rationally contemplated by human beings. No computation, however, will be made, on account of these latter cases, in order to obviate any objections that may, by possibility, be taken against the amount of the preceding deductions; and if any cavil be still raised we will, to convince such as would be disposed to pursue it, of its utter futility, concede for the moment, to the advocates of the geometric theory, the whole of these exceptions, and permit them to suppose that the absence of their preventive check would be the removal of all hinderances to marriage, natural or accidental, and the actual destruction, for the time being, of death, and disease, and distance: still they will find that their recorded opinions are, when reduced to actual calculation, as far as ever removed from possibility and truth. The number of males of 23 years old, in every 20,000 of our population, being 150, it follows, that were every individual of them to marry, the proportion could only be 1 in 133. Nay, were all the youth of England, without a single exception, to marry before they had completed their 21st year, and there were no second marriages, the number of marriages now actually taking place would be barely possible; a fact, which may of itself sufficiently intimate how little the preventive check prevails amongst them. But these calculations, however, it must be acknowledged, are founded on first marriages only, nor could they well be other at these early ages; second and subsequent ones must, nevertheless, be included, in order to determine, with some degree of correctness, the question before us.

(15) To the deep disgrace of our science and legislation, such has been the long continued neglect of statistical facts, that no official information exists in this country, which indicates the proportion second and subsequent marriages bear to the whole number. It being, however, essential to the correctness of the present calculation, that a due allowance should be made for them, an inquiry relative to the subject has been pursued somewhat at large in an ensuing (the Ninth) chapter. Referring the reader to the facts there stated, and the deductions from them, I shall here assume, as the result of the whole, that one-seventh may be the proportion of weddings in this country that are, as it respects the males, other than first ones. I trust this deduction is as correct as I am sure it is unbiassed; at all events, I feel confident that, on due examination, it will be seen that no alteration can be made in that proportion which can materially affect the issue of the question.

(16) Recurring now to the preceding data with a view to its application to the point at issue: If, from 150, who, in a population of 20,000, annually arrive at the age of 23, we deduct $4\frac{75}{100}$ who will be prevented marrying by the causes already explained, ($4\frac{75}{100}$ actually disappear from the census in that year,) making no allowance whatever for those other circumstances which, in every community, will assuredly occur, preventive of marriage, then the former number will be reduced, as has been previously stated, to $145\frac{25}{100}$; supposing all these to marry, which is the utmost possible number that can do so at the age mentioned: and, adding one sixth of the first, for the second and sub-

sequent marriages, the number of weddings at this given period, thus augmented, may by possibility amount to $169\frac{46}{100}$ in the 20,000, or 1 in $118\frac{8}{100}$ on the entire population. The actual number of weddings in 1820, being the concluding year of the last census, was 91,729, the population, as enumerated, amounted at that period to 11,261,437. The actual marriages, therefore, were in the proportion of 1 in $122\frac{77}{100}$; if it were proper to add the army and navy to the resident population, the proportion would be somewhat smaller. But, to obviate all objections on this head, as well as such as might be reasonably taken on the ground of the calculation being confined to a single year: the mean amount of the population of England, with these additions, as made by Mr. Rickman, for the three periods in which it has been taken, viz. 1801, 1811, and 1821, is 9,988,666: the total amount of the marriages of the whole term, is 1,650,576; the mean annual number, consequently, $82,528\frac{8}{10}$; the annual marriages which have actually taken place in England, during the entire period included in the three national censuses hitherto taken, compared with the mean population of that term, have therefore been as 1 to $121\frac{3}{100}$. The two calculations are little different in their results: the last is obviously on the fairest principle, and, according to it, the difference between the utmost possible number of males that might annually marry, as before described, at the age of 23, and those that actually do so, is only as 1 in $118\frac{8}{100}$, compared with 1 in $121\frac{3}{100}$; or, three individuals: or, to put it in another form,—the actual number of marriages taking place in England, in every 20,000 of its population, including those of widowers, are $165\frac{24}{100}$; whereas, it appears, that were all the men to marry at 23, still including the second marriages as before, $169\frac{46}{100}$ might possibly do so. Nor is this difference of $4\frac{10}{100}$ single males, to be wholly transferred to the custody of the preventive check; hinderances to marriage, totally distinct from its control, which have been already referred to, though not admitted into the calculation, will continue to exist in every state of society, and in all countries upon earth. These further limitations, I repeat, are left to the reader's own determination[1].

(17) I am aware that a method of partly determining the question, entirely different from the foregoing, is given by Mr. Malthus. He instructs us to compare the number of deaths, at a given period, with the marriages of a preceding one, the date of which is to be fixed by the supposed distance between the mean age of death and that of marriage; the difference between which is to indicate the true proportion of the born who live to marry[2]. The very principle of this computation is founded on vague supposition, and, in the instance before us, on, I conceive, a very erroneous one; assuming, as it does, seven years as the limit of the distance between the age of marriage and the mean age of death in England[3]: I shall not, therefore, attend to the obviously false conclusions to which it has led. There is, however, a mode of calculation dissimilar to the one already pursued, which may be adopted in other cases, and which must, apparently, lead to a satisfactory conclusion. In countries where the births and mar-

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[1] Since writing the above, in adverting to the table given from the Registers of Dr. Granville, relative to the Benevolent Lying-in Institution, and the Westminster General Dispensary,* I find that the mean age at which the 876 females he has recorded, married, was 21.388. The fact strongly corroborates the assumptions regarding the other sex in this chapter, and shews how exceedingly little the "preventive check" can voluntarily prevail; that it does so, however, in the female sex, to a certain extent, there is no doubt, owing to the number of males who are perpetually absent from the country.

[2] Malthus, Essay on Population, vol. i., p. 471—495.

[3] Ibid., p. 485.

* Report on Friendly Societies, Appendix, pp. 134, 135.

riages are given, the former transferred to the nubile age, and diminished agreeably to the operation of the law of mortality, during the interval, will, of course, give the utmost number that can possibly marry, at least, for the first time, in the entire community; to which must be added a due proportion for second and third connexions, but not for the deferred ones; for these, it is evident, must, year by year, balance each other, the population remaining similarly circumstanced. The exceptions already adverted to, as existing in all communities, being deducted, the remaining sum will express the greatest number of males that can marry at the period given, or, in other words, the utmost possible number of marriages; the actual number, then, taking place will never exceed this; and, in proportion as it falls short of it, does the hinderance to marriage, whatever it may be, prevail. Now, to put the preceding conclusions, relative to England, to a further test, by varying the mode of obtaining them, and, at the same time, somewhat advancing the period of marriage. If we take the male births between 1791 and 1800 from the national census of 1801, we shall find them, as subsequently rectified by Mr. Rickman, to amount to 1,184,903; deducting the mortality that would take place between that term and 1820, the remainder will be those in existence at the latter period, being an average interval of twenty-five years, as it respects the whole term. But the calculation of the rate of mortality is, in the present instance, unnecessary, inasmuch as the last census gives us the number in existence between 20 and 30 years of age, or rather, their proportion calculated upon about seven-eighths of the whole population, which clearly indicates the amount of the whole. In 4,808,898 males, whose ages were ascertained, there were of those from 20 to 30 years of age, 706,757; consequently, on the entire number enumerated, viz. 5,483,679, there must have been 805,928 in existence at that period of life: from this sum ought clearly to be deducted the hinderances to marriage not resolvable into the preventive check, which will not be, proportionably, so numerous on the whole term, as in an earlier year in it; but they cannot possibly be overrated, I think, at 2 per centum, including the prevailing sickness throughout. This will reduce the marriageable number to 789,810; a sixth, added for second and third marriages, will give the utmost possible decennial number of marriages at the average age of 25, as 921,445, or of annual ones, 92,145. The actual number of weddings in 1820, the year answering to the average age above mentioned, was 91,729. Admitting, therefore, these data to be correct, and the deductions made, which truth will neither allow to be dispensed with, nor, I think, diminished; and the proportion, assuming the accuracy of the after marriages, founded, as it is, on those parts of the national census, which are the least, if at all, liable to the suspicion of incorrectness; the result of the latter computation fully corroborates the former one, and it is this—that the annual marriages celebrated in this country only fall short of the utmost number that could take place at the age specified, by 416. One of two conclusions, therefore, is inevitable, if the preceding calculations, or rather facts, be admitted; namely, either that all the males of England, capable of the matrimonial connexion, marry at the average age of 25 years, with the exception of these 416, who then form the sole annual recruits to the unmarried class above that period of life, (which sum is obviously too small;) more certainly, the average nubile age of the great majority is considerably earlier, and the difference between the numbers in the interval, which in the sex and at about the period of life in question, is, in this country, considerable, has to be added. In either case, the males surviving the marrying period of life, and remaining single, and especially that part of them, which it is possible to imagine have so continued in consequence of the preventive check, must, however calculated, be small indeed, compared with the entire number of the community.

(18) Such, then, on every possible view of the subject, are the puny dimensions of the power which our political theorists give forth as that which alone checks the swift and destructive strides of the gigantic principle of evil, with whose progress they threaten their country and mankind. That I have accurately ascertained its exact influence I will not pretend to assert; but I feel confident that I have, at all events, succeeded in proving it, under every possible rectification of the preceding computations, to be " immaterial." The population, as given in the national census, may have been somewhat underrated; for this I am not responsible; I am, however, answerable for the proportion of second and third marriages assumed, in which I may have similarly erred. As to the necessary deductions, few, I think, will judge them to be overrated, nor would any reasonable alteration in them much influence the proportions obtained. On the whole, therefore, though I am aware that the direct information is wanting which can alone fix the question with any great degree of precision, and although I am as anxious as any one that it should be obtained, yet I am fully confident, from the nature of the facts already appealed to, and from collateral evidence on the subject still to be adduced, that the result of the foregoing computations is substantially correct.

(19) And is not actual and universal observation coincident with numerical demonstration, in relation to this important branch of our subject? The highest order amongst us is, beyond dispute, a marrying one: while even in the middle sphere, how very few forego the comforts and resist the natural necessity of the domestic connexion: but what is the influence of these, on whom nevertheless our attention is habitually and almost exclusively fixed on every occasion, compared with that of the lower and working classes, whose numbers overwhelm all comparison, and who, therefore, of themselves necessarily determine the question? Undeniably true is it that they are an early and universally marrying people; yea, our anti-populationists and political economists confess it when it suits their purpose, and fix this sacred habit upon them as their folly and their crime: it is one, however, which, while it has secured the virtue and promoted the happiness of the country, has multiplied its means and extended its power, and constituted Britain the most powerful and prosperous empire of the world.

CHAPTER IX.

OF THE METHOD OF CALCULATING THE COMPARATIVE PREVALENCE OF THE PREVENTIVE CHECK IN DIFFERENT TIMES AND COUNTRIES.

(1) THE method pursued by our anti-populationists in estimating the comparative prevalence of what they suppose to be the great regulator of the human increase, remains to be examined; when it will be seen that if their mere suppositions regarding it are egregious mistakes, their calculations, when they resort to them at all, are as essentially erroneous. The rule adopted by them to determine this point is indeed as simple as it is universal; it is this,—to divide the amount of the population by the annual marriages, determining, on a comparison of the results thus obtained, the relative prevalence of the preventive check in the different countries so examined.

(2) Now, the utter fallaciousness of any computations thus formed, will be apparent by adverting to the very nature of this "check." The male births which survive the nubile age, and are prevented, by other than physical obstacles, from entering into the marriage state, may be said to prove its existence, and the number of these, compared with those who marry, indicate the extent of its prevalence. But when these proportions are calculated upon the entire number which compose such community, and, with a further view of contrasting them with those of a similar nature which exist in others, the question becomes much more complicated. In this case two circumstances have to be especially considered; first, the law of mortality, or the

mean duration of life; and secondly, the rate of increase respectively prevailing in the countries so compared, both which exceedingly vary throughout the world; and, though totally lost sight of in the computations of our theorists, are so important in their consequences, as not merely to correct their calculations in regard to the various countries to which they appeal, but to reverse them altogether. This, I apprehend, requires little proof. In a stationary population the number existing will be precisely that of the number of the births, multiplied by the mean duration of life; to elongate the latter, therefore, without any increase of the former, would be to augment the population to that degree; and supposing the same proportion of the born still to marry, their relative number, computed on the whole, would be evidently diminished in a corresponding ratio. Furthermore, and still supposing the same law of mortality to exist, the rate at which the population increases "by procreation only," has evidently to be considered in this mode of determining the question. Births, and the marriages which they ultimately form, are evidently not contemporaneous, the average age at which the latter take place has to intervene; and however greatly the population may augment in that interval, the utmost possible number of the present weddings is limited by the births of the former period, and remains fixed. The marriages, therefore, in such a case may, as calculated on the entire population, seem relatively to diminish, while the proportion of the surviving births who marry (which is the present point) may remain the same, or even be on the increase. Whenever, therefore, comparisons are meant to be made, on the method under consideration, as to the prevalence of the preventive check in one and the same country at different periods, or between different countries at the same time, these differences in the duration of life, and in the rates of increase by propagation only, though lost sight of by our political computists, are evidently essential to the calculation.

(3) Arithmetical processes, verbally explained, are generally obscure however incontrovertible; and the fact that mine may be more than usually so, must apologize for my perhaps too frequent and broad illustrations. Suppose, in exemplification of the first case, a community of two thousand antediluvians, stationary in numbers, and of the uniform longevity of a millennium each; and let all of them marry at puberty: here, only one annual marriage in the two thousand could take place. Suppose another society, consisting of the same number and similarly circumstanced in all respects, excepting in the term of life, which should be only one tenth of the duration of the former; let these also marry as before, and without exception: the average number of annual marriages in this latter instance would be ten in two thousand, or one in every two hundred. Now, it is evident that the mode of computation I am combating would prove that the preventive check prevailed just ten times as much in the former as in the latter community, though it is quite clear it would have no existence whatsoever in either.

(4) In exemplification of the other point, the necessity of computing the different rates of increase arising from a variation in prolificness in times and countries thus compared: suppose two communities of equal numbers twenty-five years ago, the nubile age in each being that term, and both in other respects similar. The one, however, doubles its population "by procreation only" in these five-and-twenty years, while the other remains stationary. At the former period, the births in both being equal, the number surviving

to the present time consequently remains so; now, though all marry at the marrying age, and the actual numbers of the weddings are therefore exactly coincident, it is nevertheless equally evident that their proportion, calculated upon the contemporary population to which they respectively belong, would differ in a duplicate ratio. According to the present mode of computation, therefore, the "preventive check" would appear twice as powerful in the advancing as in the stationary community; though, in reality, it would have no existence in either, or at all events, if it existed at all, it would exist equally in both.

(5) The fallaciousness of the usual method of determining the comparative prevalence of the check under consideration is, therefore, I think, abundantly manifest; and, even were the preceding rectifications applied, others of a different and more complicated nature would still have to be included, before it could lead to correct results: into these, however, I shall not enter, it being no part of my purpose to replace the far plainer mode of calculation, pursued in a preceding chapter, by one which, however amended, would still have to rest on a series of suppositions. It concerns my subject, nevertheless, to proceed in pointing out, by the evidence of facts already adverted to, as essential to the calculations, the false deductions which, as might reasonably be expected, have resulted from so erroneous a principle.

(6) The writer, who has been the most copious on the supposed operation of the preventive check, and who has calculated its influence on the erroneous principle described, has pointed our particular attention to Norway, Sweden, and England, in confirmation of his notions on the subject. On the first of these countries he lavishes his unsparing encomiums, in consequence of the supposed meritorious comparative abstinence

from marriage, the marriages there being, as he informs us, only one in 130[1]. Nor does this, their political merit, arise from ignorance or accident, but it is, we are assured, the result of superior wisdom on this particular point, Norway being the country, and "almost the "only one, where a redundant population is appre-"hended," and the principle, "in some degree, seen "and understood[2];" and this rare example of virtue is not without its reward, which is, in this case, superior health[3], and plenty[4], and even thicker legs[5]. The mortality in Norway is given, on the same authority, as one in 48.

(7) Next in the order of this political merit, as classed by the same author, with, I think, the exception of Switzerland, stands England[6], a country which has the singular fortune to be alternately praised and blamed by this and similar writers, touching the very same matter. Here, it is presumed, "it will be allowed, "that the preventive check operates with considerable "force throughout all the classes of the community[7]," inasmuch as, including Wales, the annual marriages are, to the whole population, as one in 123½, "a smaller proportion," except in the instances already named, "than," as he tells us, "obtains in any of the coun-"tries examined." The mortality is stated, in this case, as one in 40[8].

(8) Lastly, in Sweden, a country where those public efforts are made in encouragement of the population, which our authority takes upon himself, alternately, to blame and ridicule, we are told the marriages are (*proh pudor!*) one in 112. A long and melan-

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[1] Malthus, Essay on Population, p. 184.

[2] Ibid., p. 194.

[3] Ibid., p. 189.

[4] Ibid., p. 188.

[5] Ibid., p. 189.

[6] Ibid., p. 302.

[7] Ibid., p. 302.

[8] Ibid., p. 302.

choly chapter describes the consequence of this flagrant state of things. The mortality here is given as one in 34¼.[1]

(9) In examining these several results, let us first assume the population, in each instance, to be stationary. In this case its whole number, divided by the annual deaths, will give, what is called the expectation of life[2], which, "multiplied by the number of yearly births, will be the number of the inhabitants[3]." Merely premising that the mortality, though differing in degree, will still be distributed, in each instance, conformably to the general laws of Nature, these are the conclusions to which the very data furnished us respecting the countries mentioned, for a directly contrary purpose, infallibly conduct us. In every ten thousand annual births, there will be found to marry in Sweden, 6203 persons; in England, 6493; and in Norway, 7384; supposing, as before stated, the population to be stationary in each.

(10) But the population is not stationary in any of these countries: on the contrary, it is advancing in them all; but severally in such different ratios, as still further to confirm the preceding conclusions. Thus, in Sweden, exclusive of Finland, the inhabitants amounted in 1798, to 2,352,298, and in 1823, to 2,687,457; an increase of rather above 14 per centum, in 25 years: in England, the advance between 1801 and 1821 is represented to have been from 8,331,434 to 11,261,437, or upwards of 35 per centum in but 20 years: while in Norway, the augmentation has been from 835,451, in 1815, to 1,000,152 in 1825, little less than 20 per centum in 10 years only. That the differences in

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[1] Malthus, Essay on Population, Book ii., c. ii., pp. 196—209.

[2] Dr. Price, Reversionary Payments, vol. ii., p. 147.

[3] Ibid., vol. i., p. 237.

these increments are not wholly resolvable into the variation in the expectation of life prevailing in each country respectively, is clear; and it is equally so that the excess, if assignable to the development of greater prolificness, requires that the radix of births, on which the above proportion of marriages is calculated, should, in each instance, be diminished in proportion to this increase; the numerical results already obtained will, therefore, in this case, be confirmed in their arrangement, and heightened in their proportions.

(11) If, therefore, the usual mode of ascertaining he operation of the preventive check, thus corrected, and the facts presented to us, are at all to be relied upon, the order in which Mr. Malthus has placed these several countries, in reference to its operation, ought to be precisely reversed, as it clearly proves that, however it may prevail in Sweden, it prevails less in England, and least of all in Norway.

(12) Common observation might be properly appealed to, in order to determine on which side, in these conflicting statements and calculations, the truth rests. That the preventive check does prevail, in some degree, in Sweden, is admitted, and the fact is attributed, by some writers, to the too compulsory methods which the Government there has taken to enforce marriage[1], which ought, in no respect, to be interfered with in any country, except by the removal of all general impediments to that union. But its operation is more distinctly proved by the proportion of illegitimate children, to the whole number of the births in that kingdom. That it prevails little here has been already fully shewn, and is further manifest, from the far smaller number of those constant and unhappy evidences of its prevalence, just referred to. As to

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[1] Radcliffe, Journey through Sweden, p. 193.

Norway, let the authority of a fellow-traveller of Mr. Malthus decide, and one of the most interesting and intelligent that ever trod the surface of the earth. Dr. E. D. Clarke, speaking on this very subject, in reference to the Norwegians, says, "they marry young; "and have only to marry; the means of subsistence "follow of course[1]." The former writer, I observe, now mentions, in a note, the pretended fact of the paucity of children there[2], as a reason why the preventive check ought to have been calculated even higher than he has done it[3], but still flatly contradicting him, Dr. Clarke not only mentions their numerous families, but speaks of the fact, as one of common observation, and assigns a reason for it, already quoted[4]. Indeed, the high rate of increase actually prevailing in Norway confounds the assumption, that the marriages taking place there, or the children resulting from them, are disproportionately few, as fully as the great amelioration which, as we shall fully shew, has accompanied their augmenting numbers, confronts the impious notion that the sacred source of existence, the principle of population, is an evil, either in its nature or its consequences.

(13) The foregoing calculations, as well as many others which the subject renders necessary to be pursued, may, probably, prove still more irksome to the reader than they have been wearisome to the author; they are, however, of the highest importance; and, like every thing connected with this momentous question, are inevitably practical in their final consequences. To give a pregnant proof of this, and in relation to the very point under consideration, the political philo-

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[1] Clarke's Travels in Scandinavia, p. 707.

[2] Malthus, Essay on Population, p. 190, &c.

[3] Ibid., vol. i., p. 261, note.

[4] Dr. Clarke, Travels in Scandinavia, p. 528.

sophers of France, imbued with the modern doctrine of population, assert at present, that the preventive check is the necessary regulation of their numbers, and exult in its supposed increasing prevalence. The notions peculiar to the system, which they have unhappily derived from us, have widely extended their chilling influence, and have even infected the legislature of that country, as they have also our own. Hence, on a recent occasion, propositions were made to revive one of the most unnatural and unjust regulations, as it regards the great mass of the people, that ever disgraced civilized society, the law of primogeniture, the sole argument, in favour of which revulsion, was the geometric theory of population; the inevitable effect of which, it was contended, would be the division of the property of the country into such minute portions, as to reduce the whole of the inhabitants to destitution and beggary. How the proposition terminated, I regret to say, I do not remember, but the arguments in favour of it are present in my recollection. But if these legislative anti-populationists had been guided by their senses instead of by their system, they would have judged differently. Seeing that the births of the country had considerably diminished within half a century past, they must have concluded, that as far as the principle of human fecundity was concerned, the visible tendency in France must have been to the accumulation and engrossment of property, rather than to its subdivision; and that, if it pleased Providence somewhat to lengthen the narrow span of human existence, so as to increase their co-existing number from the same proportion of births, the present possessors might have been expected to be the last to have given utterance to complaints on that ground.

(14) To return, then, to the immediate subject before

us. I subjoin part of a table, constructed by M. Benoiston de Chateauneuf, exhibiting the state of France, in relation to the movements in the population half a century ago, who, strange to say, in close conformity with the doctrines of Mr. Malthus, to whom he appeals, deduces, from the facts he presents, the increased prevalence of the preventive check. The corresponding column, which represents the several proportions specified, as existing in the present state of France, differ very little from those which he likewise gives, but the former, as corrected by subsequent facts and observations, published by authority, are preferred; they are as follow:—

TABLE XXIV.

FRANCE.

ANCIENT STATE[1].		PRESENT STATE[2].	
Population in 1780, on an average of 10 years	24,800,000	Population in 1820..	30,451,187
Deaths..............	818,490	Deaths.............	765,402
Legitimate Births.....	942,720	Legitimate Births....	895,841
Illegitimate ditto......	20,480	Illegitimate ditto	66,731
Marriages	213,770	Marriages	227,660
BEING		BEING	
1 Death in every........	$30\frac{2}{10}$	1 Death in every ...	$39\frac{785}{1000}$
1 Birth in every	$25\frac{7}{10}$	1 Birth in every	$31\frac{62}{100}$
1 Marriage in every.....	[3]116	1 Marriage in every..	$133\frac{76}{100}$

(15) Now the facts presented above, applied as in the previous calculations, give in the former period, when the expectation of life in France was $30\frac{2}{10}$, and

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[1] M. Benoiston de Chateauneuf, Bul. Univers. Géog. et Statistique, t. vi., p. 172.

[2] M. Mathieu, Annuaire, 1827, p. 96.

[3] This sum is printed 111.3, evidently either an arithmetical or typographical error.

the yearly marriages 1 in 116, from every 10,000 annual births, 5207 annually married, and in the latter one, the expectation of life having improved to nearly 40 years, and the annual proportion of the marriages being about 1 in 133¾, from the same number of births, 5949. Further calculations, as to the increase in France by procreation only, seem unnecessary; the population in that part of its movements exhibiting no signs of augmentation. But a single glance at the table suffices, without the least attempt at calculation, to prove the fallacy of the assertion that the preventive check prevails in France more, or as much, as it did, formerly. With fewer births, even including an unhappy increase of nearly fifty thousand illegitimates, there is, nevertheless, a greater number of marriages; and that these are not still more numerous is undoubtedly owing to that revolution which swept away myriads of the youth of France, and condemned, as the chief magistrate of its capital expressed to the late monarch on his restoration, so many of their maidens to necessary celibacy. That the consequences of that tremendous event prevented hundreds of thousands of weddings in France, there can be no possible doubt, though Mr. Malthus, perpetually pushed to the extremity of the ridiculous, by the system he espouses, gravely argues, nevertheless, "that France has not lost a single birth by the Revolution[1]." A glance at the preceding table will be the best and sufficient answer to such a strange assertion. That the preventive check does prevail in France is not meant to be denied; and that it is no cause of exultation, either as it respects humanity or virtue, the same table too clearly manifests. In the mean time, the increased expectation of life there sufficiently proves, in direct opposition to M. Chateauneuf, that it prevails less than formerly.

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[1] Malthus, Essay on Population, p. 294.

(16) But I perceive that Mr. Malthus lays it down as a settled axiom, that superior longevity would have a directly contrary effect to that which I have proved, or, at least, assumed, throughout this Chapter. Hence, speaking of Norway, but expressly referring to the healthy countries of Europe, he says, the actual proportion of marriages there, compared with that of others, will not, "even as calculated by his own method," express the full extent in which the preventive check operates[1]. The importance of a clear understanding of this point, to the just determination of the whole question at issue, must excuse my concluding the subject with some addition to the proofs and illustrations already advanced to the contrary.

(17) One would certainly think that it were superfluous to prove that in any given community, where all should be supposed to marry, and at the earliest age, the preventive check being therefore unknown, any elongation of life having the necessary effect of accumulating a larger number of co-existing inhabitants from the same number of births, must, *cæteris paribus*, lower the relative proportion of the marriages, as calculated on the entire population. But to put the question in a different, and, I trust, conclusive point of view: —every individual, belonging to whatever community, has, at birth, a certain expectation of life, as it is technically termed, which is calculated in most countries, and is simply the average duration of life in each. It is quite as obvious that every such individual is likewise born with a certain expectation of marriage, to use the same term in a somewhat varied sense, and meaning by it, in this instance, the exact amount of the

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[1] Malthus, Essay on Population, vol. i., p. 261. See the whole note.

probability of such an one being married, which probability, the certainty being unity, will always be less, whatever be the proportion. This expectation of marriage, also, like the former one, is nothing more than the average chance of every individual as calculated on the entire number of the marriages and births. And both these expectations, however varying from facts in individual cases, are, in regard to their averages, mathematically exact, if correctly computed. I may premise that the mean term of life invariably exceeds the marriageable age. Now if the sum which expresses the average individual expectation of marriage be divided by that which similarly expresses the expectation of life, the quotient will of course be the whole expectation of marriage, annually divided; or the utmost annual addition that each individual, one with another, can make to the marriages of the community; and the sum of these annual individual proportions will be precisely the whole amount of the annual weddings. Let us now assume that the term of life is lengthened, the number of marriages remaining the same; and few will contend that their proportions are necessarily relative; Mr. Malthus, indeed, argues that they are so, inversely; it being the prominent feature of his theory, that deaths invariably make room for weddings. In this case, then, the divisor, the expectation of life, being increased, and the dividend, the expectation of marriage, being unaltered, the quotient, which expresses the annual proportion of marriage individually calculated, must be lessened accordingly; and the sum of these individual proportions being that of the entire number of marriages, the latter must, consequently, suffer a corresponding annual diminution. Directly the contrary, therefore, to what Mr. Malthus asserts, is the plain fact; superior healthiness, or, in other words, comparative elongation of life, though it leave the actual number of marriages untouched, must of necessity diminish their proportion relatively to the whole population. To disencumber the preceding conclusion of all collateral considerations, again suppose that, in this latter community also, all marry, and at the earliest possible age; still the relative proportion of marriages would be diminished, exactly as the term of life enlarged, indicating an increasing operation of a cause, according to our theorists, which has in such a case no existence whatever.

(18) The preceding arguments will, however, in all probability, be contradicted, and the calculations relative to them confused by a variety of extraneous considerations; it not being very likely that so essential a branch of the system, in behalf of which a series of impossibilities have been assumed, should be surrendered without a defence founded upon suppositions of an equally extraordinary nature. But to establish, upon incontrovertible grounds, the truth contended for throughout this chapter,—that the preventive check as usually calculated, directly contrary to what is asserted concerning it, appears to operate more than it really does, in a population increasing in longevity, or from other causes, I shall, lastly, appeal from mere argument to facts. In the last census of the British Empire, the ages of the inhabitants, in its several grand divisions, are discriminated : in three of these the comparative longevity is clearly ascertained, in two of them by statistical documents, in the other by universal assent. In Wales, the term of life is found to be longer than in England, by upwards of one fifth, while, in Ireland, it is certainly the shortest : the increase has not so varied as to affect the demonstration contemplated. Is, then, the distribution of the population into its several divisions such as to sanction Mr. Malthus's notions on

the subject, or those which it has been attempted to substantiate throughout this chapter? It is thus: Calculated on a radix of 20,000 in each, there would be, between the age of 20 and 30, in Ireland, 3519; in England, 3158; and in Wales, 2996. Were, therefore, (the preventive check prevailing equally in each, or not at all,) all to marry at the period specified, it is plain that the relative proportion of marriages would be the least, and not the greatest, according as health and longevity prevailed; and the decennial number married, reduced, in each instance, to the annual proportion of marriages, would give for Wales 1 in $133\frac{5}{10}$; for England, 1 in $126\frac{6}{10}$; and for Ireland, 1 in $113\frac{6}{10}$. Results of a precisely similar character may be obtained wherever the facts necessary to the calculation exist; to give the reason for this would be to repeat the preceding argument, which, it is hoped, is unnecessary.

CHAPTER X.

OF THE PROPORTION OF SECOND AND THIRD MARRIAGES AND OF ILLEGITIMATE CHILDREN IN DIFFERENT COUNTRIES, AND OF THEIR EFFECTS ON POPULATION.

(1) The proportion of second and third marriages compared with the whole number celebrated, which appears to vary considerably in different countries, seems to have been very imperfectly ascertained, while their effect on population has been totally misapprehended. The necessity of these subsequent connexions, especially as it regards the male sex, has been clearly contemplated by the great Author of Nature; and hence he has (if I may thus speak) made calculations in regard to them, which will be the subject of consideration in introducing the true theory of population, and which will be found to rest on a series of computations of the most precise and essential character. In the mean time it may be observed, that these connexions, the prior ones being dissolved by death, sanctioned as they are by all laws human or divine, are essential to the institution of marriage, and, to a certain extent, are indispensably necessary to its ends, especially that of the preservation of the species. On this latter account their consideration becomes an important branch of the subject of population, and one, moreover, which, like so many others connected with it, seems, as just observed, to have been totally misunderstood by our late writers. In another point of view also, it is necessary to be attended to in this work; for the accuracy of the calculations in a foregoing chapter, relative to the preventive check, depend in some measure on

the proper proportion of the first to these second and subsequent connexions.

(2) The errors, about to be refuted, on this subject are expressed in the following passage of a writer already so copiously referred to, in his chapter of the fruitfulness of marriages. "It is probable," he says, "that the natural prolificness of women is nearly "the same in most parts of the world; but the prolific-"ness of marriages is liable to be affected by a variety "of circumstances peculiar to each country, and par-"ticularly by the number of late marriages. In all "countries the second and third marriages alone form "a most important consideration, and materially influ-"ence the average proportions. According to Sus-"milch, in all Pomerania, from 1748 to 1756, both "included, the number of persons who married were "56,956, and of these 10,586 were widows and wi-"dowers. According to Busching, in Prussia and "Silesia, for the year 1781, out of 29,308 persons who "married, 4841 were widows and widowers, and con-"sequently, the proportion of marriages will be given "full one sixth too much. In estimating the prolific-"ness of married women, the number of illegitimate "births would tend, though in a slight degree, to coun-"terbalance the overplus of marriages; and as it is "found that the number of widowers who marry again "is greater than the number of the widows, the whole "of the correction should not, on this account, be sup-"plied[1]."

(3) The first of these assertions, namely, that the natural prolificness of women is nearly the same everywhere, it will be the sole purpose of the ensuing Book to disprove; and the next, that such prolificness is affected by comparatively late marriages, will be ex-

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[1] Malthus, Essay on Population, vol. i., pp. 476, 477.

amined and refuted in one of the most important chapters of this. The number and influence of second and third marriages on the population, and how far their effect is counterbalanced by illegitimate births, will now be attended to. I shall first subjoin the table last referred to, on account of the further particulars it gives.

TABLE XXV.

SHEWING THE PROPORTION OF THE FIRST AND SUBSEQUENT MARRIAGES IN 14,654 WEDDINGS IN PRUSSIA, AND THE SEXES AND AGES OF THE PARTIES RESPECTIVELY[1].

Description of Persons.	Number.
Bachelors and Spinsters	10,551
Bachelors and Widows, under 45	837
Bachelors and Widows, above 45	195
Widowers under 60, to Spinsters	2,084
Widowers above 60, to Spinsters	249
Widowers under 60, to Widows under 45	478
Widowers above 60, to Widows above 45	260
	14,654

(4) The above table is interesting in relation to the particular proportions it exhibits, especially as to the ages of the re-marrying parties; in other respects it is plainly inapplicable to the present state of things, as indeed any document of this kind, derived from Prussia, I trust would be, if applied to similar calculations respecting other countries, and especially this: and, amongst other reasons, for this important one more particularly,—the facility with which divorces are obtained in that country greatly augments the number of after marriages; many of such divorces, it cannot be doubted, being effected for the very pur-

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[1] Susmilch, Gott. Ordnung., th. iii., p. 94.

pose of forming them[1]. This is regarded as one of the greatest evils prevailing in that country, and perhaps is only to be matched by another of a directly contrary nature, which exists in this, namely, the difficulty, or, indeed impossibility, of a poor man's obtaining a divorce here at all. Adultery, both according to the laws of God and man, dissolves marriage; ours profess to do so, but it is in reality only in behalf of the rich, that is, the few, that they interfere in this Christian country. No means exist within the reach of the great mass of the community to do that which the dictates of nature and the doctrine of Christ authorize, and indeed command a man to do under this insufferable injury,—to put away his wife and take another. The poor man that does this, in the only practicable way that is left open to him, and sanctifies the act with the solemnities of his religion, is to be tried as a bigamist and punished as a felon! But to return; I do not so much object to the rectification proposed by Mr. Malthus, which is an addition of one sixth for these second and subsequent connexions, as to the source thus tainted, from whence it is derived.

(5) Turning, then, to less exceptionable and more recent documents, I find the information required is minutely given on official authority, as it respects the capital of France; and is, for two of the last years, as in the ensuing tables.

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[1] La grande facilité avec laquelle les habitans de la Prusse peuvent se degager du liens des mariages.—Les divorces sont très nombreux; 1 sur 37 mariages.—Bullet. Univers. Géog. et Statis. t. v. p. 67.

TABLE XXVI.

SHEWING THE FIRST AND SUBSEQUENT MARRIAGES IN PARIS, IN THE YEARS 1826 AND 1827.

1826.

Marriages in Paris; 7,959 couples, 15,918 persons.

Description of the Persons Married.	No. of Marriages of each Class.	1st Marriages of Men.	2nd & 3rd Marriages of Men.	1st Marriages of Women.	2nd & 3rd Marriages of Women.
Bachelors and Spinsters	6606	6606	..	6606	..
Bachelors and Widows	379	379	..	..	379
Widowers and Spinsters	767	..	767	767	..
Widowers and Widows	207	..	207	..	207
Individuals	..	6985	974	7373	576

TABLE XXVII.

1827.

Marriages in Paris; 7,754 couples, 15,508 persons.

Description of the Persons Married.	No. of Marriages of each Class.	1st Marriages of Men.	2nd & 3rd Marriages of Men.	1st Marriages of Women.	2nd & 3rd Marriages of Women.
Bachelors and Spinsters	6456	6456	..	6456	..
Bachelors and Widows	368	368	..	..	368
Widowers and Spinsters	708	..	708	708	..
Widowers and Widows	222	..	222	..	222
Individuals	..	6824	930	7164	590

(6) The results these tables present are highly confirmatory of each other, as are similar ones which I might likewise quote, were it necessary. In Paris, then, very uniformly, nearly one-tenth of the persons marrying, including both sexes, have been previously married; and distinguishing the sexes of these re-marriages, those in which the males had been remarried, were not quite an eighth of the whole number of weddings; those, in which the females were similarly circumstanced, not quite one-thirteenth. But the number of the second and subsequent marriages, compared with the first ones of each sex respectively, is, as it regards the males, nearly one-seventh; the females, one in between a twelfth and thirteenth.

(7) Such are the various proportions which the second and third marriages form in the city of Paris; but my impression is, that the whole number of such connexions would be proportionably smaller in the departments than in the metropolis; and again, that it would be still less in England than in either, owing to the superior longevity of the latter country, and especially of its females, which circumstances, however, may perhaps be at any rate balanced by some difference in the comparative habits of the two countries, in relation to matrimony. No documents, at least none of which I am aware, exist, enabling us to determine this point as it regards the great mass of the community. In a very large town[1], where the number of the marriages, on the average of ten years, calculated on the mean amount of the population during the same term, was as high as 1 in 98, and indicated, therefore, a considerable influx of marriageable

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[1] Leeds. Average annual number of marriages, 1810 to 1820—744.5. Mean population, 73,165. Total number of marriages in 1828, 1074; in which number there were 983 spinsters, and 91 widows.

persons, as well as the absence of the preventive check, I have found, on an examination of the registers, that the proportion of widows, compared with that of the spinsters, (the only distinction in relation to the present question which the registers of England recognize,) was between an eleventh and a twelfth, and, compared with the whole number of marriages, somewhat exceeding a twelfth. The examination only extended to one year, in which the proportion seemed so uniformly distributed as to render further research unnecessary; and the single result is so nearly coincident with that regarding the like class in the Paris registers[1], as to warrant us in assuming the latter to be fairly applicable, in their other details, to the large towns of both countries; still conceiving, however, that the country parts of each kingdom would give a comparatively smaller radix of second marriages, in which, nevertheless, the relative proportions of the sexes composing them would, in all probability, be pretty accurately preserved. I shall assume one seventh of the whole number of the annual marriages of the males as second and third ones, that is, contracted by widowers.

(8) I am bound, however, in candour to state, that a document, which I have completed, with considerable attention, for other purposes, seems to vary considerably from the above calculations, as referrible to England. Turning to a synoptical register of the British Peerage, I find that, in the two last-deceased generations of that body, nearer a fifth than a sixth

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[1] It may, at first sight, be objected that Paris may not be a marrying place, (this is, however, a mistake; there are about one in five more marriages there, than in all France, on the average,) but this does not affect the inquiry. It is not the marrying class, in proportion to the whole population, on which it turns, but it is in the marrying class, exclusively considered, where these proportions are to be sought, and which are doubtless influenced by causes operating with great regularity every where, on individuals similarly disposed and circumstanced.

part of the marriages, as it respects the Peers, have been other than first ones. But I am, nevertheless, still disposed to believe that the proportion already mentioned, is, on every consideration, likely to be true, as it regards the great bulk of the people. Not merely are the Peers, emphatically speaking, a marrying class of society, (a very small proportion of them, who arrive at the age of maturity, ever remaining unmarried,) but this is strikingly the case as it regards the widowers amongst their number. And with this evident disposition, in case of the dissolution of their first connexions, as they are, most unquestionably, in a more advantageous situation for forming subsequent ones than any other class of the community, so I am persuaded that they will generally be found to avail themselves of that advantage. Indeed, actual observation, independent of these considerations, must convince any one that the marriage of widowers, amongst the Peerage, is nearly universal. The Peers of the United Kingdom marry considerably more than once each, on the average of their entire number, including those who never do marry. Few, however, I confess, after all, of the working classes, or, in other words, of the great majority of the community, remain long single.

(9) I had actually written thus far—my conviction of the truth of the last assertion strengthening, and my confidence in the preceding calculation, involving so great an apparent difference between the habits of the two classes in this respect, proportionably abating—when it occurred to me, on further consideration, that the discrepancy was resolvable, in great measure, into the different terms made use of in the two calculations; and that, after all, the variation, when duly estimated, would be slight in itself, and not exceeding that which would, on any account, be demanded by known facts.

And such, I think, turns out to be the case; and it affords another proof, were any wanting, of the advantage of honestly adhering to facts, and abiding the consequences; it is thus, that in any system founded upon correct principles, we are led to those just proportions and true relations which distinguish the features of truth. The difference, then, between the proportion of 1 in 5.35, in one case, and that of 1 in 7 in the other, (or, what is the same thing, 1 upon 4.35, and 1 upon 6,) nearly disappears when it is considered that the former, indicating the proportion of the second and third marriages of the Peers, is calculated on the sum of these second and subsequent marriages, compared with the first ones, as occurring amongst the same individuals, whose number is, therefore, fixed; whereas, the latter is the annual proportion of these after connexions, computed on the number of the first ones occurring amongst other individuals, whose number is, in the present instance, increasing. In the former case, the inquiry is individually pursued, which has precisely the same effect as though the numbers were stationary; in the latter, the calculation is on the mass; and as it is quite evident that first and second marriages, as it regards the same persons, are not contemporary events, it is equally so, that in attempting to deduce from the general annual results, which represent them as such individual computations, the same rectification is necessary on this occasion as in others already pointed out, where the population is in a state of progression, and when consequently the various results would, in proportion to its augmentation in the interval, be represented as too low. In the present instance, assuming fifteen years[1] as the average duration of the period intervening between first and subsequent marriages, it is evident that the second and third marriages of any given year must, in fact, be entered into by those who, one with another, married, for the first time, fifteen years previously. Having, therefore, the number of these after marriages, if we wish to estimate the proportion they bear to the first ones, from which they actually result, it must be by comparing them with those which took place at the previous period, and not with those of the present one; with the latter of which they have, in strictness, no connexion whatever. Supposing, then, that in the average interval between these events, the population of the country has advanced twenty-five per centum, (which, according to the late census, it would have about done,) the following simple calculation will exemplify the fact I have been attempting to explain, and will reconcile the apparent dissonance between the events under consideration, in the two opposite classes of society, as far as seems consistent with the different circumstances in which each is placed. The first column commences with 1000 marriages, which, according to the proportion alluded to, as existing amongst the Peerage, add 230 second marriages to those taking place fifteen years afterwards, when the first ones, agreeably to the increase in the population, have augmented to 1250; now it is evident that, individually considered, as in the instance of our appeal to the Peerage, these 230 after-marriages are celebrated by the 1000 couples who married, for the first time, at the former period: the whole number of marriages contract-

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[1] It is somewhat singular that I had fixed upon this term as the best supposition I could form, before it occurred to me to refer to the synopsis of the Peer-

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age, already mentioned, when I found in the 59 cases of second and third marriages, which I had entered as having occurred in the present generation of Peers, (which I preferred adverting to, rather than preceding ones,) the sum of the several intervals was 929 years, the mean average duration being, therefore, 15.7.

ed by them being, therefore, 1230, and the proportion of their second and subsequent ones to the first, being as 1 to 5.35. But if these 230 subsequent weddings are added to the 1250 first ones, which are taking place at the same time, the amount of both is 1480, and the proportion of the second marriages, computed on the latter number, then sinks from 1 in 5.35 to 1 in 6.4. The latter mode, which seems to be the only one pursued at present, is evidently fallacious, except when applied to a stationary population. The following table is only extended to a few periods, and will suffice to remove the obscurity that may have attended the preceding explanations.

TABLE XXVIII.

EXEMPLIFYING THE METHOD OF DIRECTLY DETERMINING THE RELATIVE PROPORTION OF FIRST AND SUBSEQUENT MARRIAGES IN AN INCREASING POPULATION.

Periods. Year.	First Marriages.	2d and 3d Marriages.	Total of Annual Marriages.	Individual proportion of 2d and 3d Marriages to 1st ones, 1 to	Annual proportion of 2d and 3d Marriages to 1st ones, 1 to
1	1000	..	..	..	..
16	1250	230	1480	5.35	6.44
31	1562	287	1849	5.35	6.44
46	1953	359	2312	5.35	6.44

(10) The above Table is calculated upon the data which the register of the Peerage I have alluded to suggests; in which, as before observed, every 4.35 first marriages yield one after-marriage, or, what is the same thing, in every 5.35 marriages, 1 is a second one;

which proportion, if transferred to an entire population, which was increasing after the rate of 25 per centum, in about fifteen years, (the interval assumed as that on the average existing between first and subsequent marriages,) would, when calculated as usual on the entire number of annual marriages, appear as 1 in 6.44 only. As it respects the entire community, I have taken a somewhat, and but little, smaller proportion as that of the widowers who re-marry, namely, one-seventh of the whole annual weddings, which is a greater relative number than, as we have seen, exists in Paris, and considerably so if the larger increase in the population of this country be duly considered. On the whole, I leave the conclusion to the reader's judgment, without much apprehension that I shall be accused of having taken too great a latitude in the determination.

(11) The proportion of males re-marrying has been the more particularly attended to, inasmuch as the calculations relative to the supposed operation of the preventive check, in the sixth chapter of this Book, are to a certain degree affected by it; and, indeed, it seems, as is there mentioned, the only assumption apparently liable to much controversy. The like proportion of females, not bearing so materially on the main argument, may be determined with less scrupulousness; perhaps enough has been advanced to warrant us in fixing upon a twelfth as the annual proportion of widows that re-marry, compared with the entire number of the weddings of their sex. I observe, indeed, that the number of such re-marrying has been supposed to exceed that of the widowers so doing: an absurdity which, if common observation could not have corrected, one would have thought statistical documents of every kind, whether of the living or the dying, might

have done. The great majority of widows, compared with the widowers in every community, (after every possible allowance has been made for the earlier period of life at which the females marry, and their superior longevity,) indicates most indisputably that the widowers have been still further and greatly diminished, when compared with the widows; and their comparative mortality being already computed, no other cause remains for the remaining disproportion but the one assigned, and in at least the degree assumed, namely, the more frequent re-marriages of the widowers. And this fact likewise necessarily implies another, which is this: there must be a plurality of cases in which the widowers marry spinsters, and not widows, compared with those in which widows marry bachelors; otherwise these re-marriages would balance each other, and leave the difference, already mentioned as every where existing, still unaccounted for. And these facts likewise are equally substantiated by universal observation and statistical documents.

(12) In proceeding to estimate the prolificness of these second and subsequent marriages, and their effect on population, a subject on which, as it appears to me, Mr. Malthus has so greatly erred, some further classification is necessary. This has been done as follows, on something better than mere conjectural grounds; though, in the absence of actual information, I wish the conclusions to be considered in every respect as mere approximations to the truth, and hope that those whose province and whose duty it is to cause better and satisfactory information to be given to the public, will not long delay rendering it. The proportions are calculated on a radix of 10,000 marriages; the second and subsequent ones being given somewhat higher than assumed in the instance of England, in order not to overstate an ensuing part of the argument.

It will not, I think, be objected that the fecundity of these subsequent connexions is over-rated, when it is considered that the entire community is contemplated in the rates assumed, with the bulk of whom few inducements to marriage exist but such as are purely natural and personal, youth and health, whose concomitant is fruitfulness. The marriages of the widowers, I remark on this statement, are, on the average, attended with three children each. On turning to the synopsis of the Peerage, I find that the second and third marriages of the Peers of the United Kingdom, of the two last generations, have yielded on the average, 2.75 children each—a somewhat smaller proportion; but this rank of society, as will be more fully shewn hereafter, is less prolific than the lower ones.

TABLE XXIX.

SHEWING THE SUPPOSED PROPORTIONS IN 10,000 MARRIAGES OF THOSE OF SINGLE PERSONS, WIDOWERS AND WIDOWS, AND THE PRESUMED AVERAGE PROLIFICNESS OF EACH[1].

Description.	Number of Marriages.	Prolificness of each.	Amount of Prolificness.	Total.
Total Number of Marriages .	10,000	4.	..	40,000
Bachelors and Spinsters . .	8,100	4.26	34523	40,000
Bachelors and young Widows	420	2.75	1155	
Bachelors and aged Widows .	80	..	..	
Widowers and Spinsters . .	1,100	3.5	3850	
Widowers and young Widows	210	2.25	472	
Widowers and aged Widows .	90	..	..	
	10,000	2.88	5477	

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[1] Since I contracted the above calculation, I have seen in the Swedish Report, that, in the year 1825, there were 23,640 marriages contracted in Sweden, of which 19,097 were celebrated between those previously unmarried; affording a

(13) In the above attempt at classification, it has not been my wish to exaggerate the proportion of the prolific in the second marriages. If such had been my bias, I might easily have sanctioned an attempt by documentary proof; thus, in the page preceding that from which the Prussian table already quoted occurs, there is a table given in which the proportion between the bachelors marrying young widows, compared with those marrying aged ones, (namely, above 45 years old,) is given as 53 to 3, on an average of 24 years[1], or 17 to 1; whereas that which I have adopted is little more than 5 to 1; nor am I conscious of having misstated the prolificness of the after-marriages; this, however, must be left to the reader's judgment, in the absence of all existing documents decisive of the matter, unless I may be allowed to denominate as such that to which I have so frequently appealed. But absolute precision is not in this instance necessary, as, under every possible alteration of the preceding facts which should preserve to them the semblance of reality, they must still be decisive of the remaining points at issue.

(14) The preceding table presents these two results: first, that those marriages which, as it respects one or other, or both of the parties contracting them, are other than first ones, produce above an eighth, or, to speak more precisely, 15.865 per centum, of the whole number of births; second, that the average individual prolificness, estimated on the marriages promiscuously, would, were they all first ones, be increased from 4 to 4.26, which would therefore make an addition to the actual births of 6.5 per centum, or

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very gratifying corroboration of the correctness of the main fact assumed in my table, which supposes that, amongst 10,000 marriages, 8100 take place between single persons. The Swedish proportion would be 8079, a difference of only 21!—See Kongl. Tabell. Commiss., &c. 1828.

[1] Gott. Ordnung., Th. iii. 93.

nearly one in fifteen. The first of these facts, under every possible rectification, will suffice to shew how greatly Mr. Malthus has mistaken the influence of second and third marriages, in the passage quoted from him at the commencement of this chapter; the second will as completely expose another error into which he has fallen in the same paragraph; namely, that the number of illegitimate births included in the registers, tends but in a slight degree to counterbalance the deficiency in the average prolificness of marriages occasioned by second and third connexions, which, he supposes, ought, in great measure, to be deducted before that prolificness can be properly estimated. The preceding calculations, applied to any of the neighbouring countries, will instantly shew the fallacy of his suppositions.

(15) In Prussia, the prolificness, as usually calculated, including the illegitimates, was, in 1817, about four births to a marriage. The actual number of the legitimate births was 400,455; which, had the 112,034 marriages been all first ones, would, according to the preceding computation, have been increased 6.5 per centum, and have, therefore, amounted to 426,485. The question then is, do the number of illegitimate children only "tend in a slight degree" to counterbalance this deficiency? The deficiency is 26,030;—the number of illegitimates, 53,576. But, for reasons already stated, as influencing so materially the proportion of subsequent marriages in Prussia, I will lay no stress upon this particular instance.

(16) In France, to take the facts from a document inserted in a preceding chapter, comprehending a period of five years, the legitimate births are averaged at 895,841; these, increased, on the principle before mentioned, by 6½ per cent., would have amounted to

954,073, had all the marriages been first ones. The difference here is 58,229. Do the unfortunate class under consideration tend but "slightly" to make it up?—they amount to 66,731. I rely with the more confidence upon the present instance, as the calculations are, in great measure, founded upon the facts which the statistics of this country furnish, though not carried to the full extent which the latter would warrant, as before observed.

(17) In Sweden, the legitimate births of 1823 were 91,049: these, had it been possible that the 23,993 marriages which produced them could have been all first connexions, might have amounted to 96,967. But here again, so far from the supposition being true that the illegitimate children have only a slight tendency to make up the deficiency, they still greatly exceed it, amounting to 7,210.

(18) Concerning England, no official information touching this subject is extant. But if she furnishes so high a contrast to the foregoing, and other surrounding countries in this respect, as that not more than $\frac{1}{47}$ of the births are illegitimate, in the name of decency, and of God, let the incessant accusations against her poor, and their early marriages, cease: accusations which a reverend political economist has heightened into vituperation, and connected with her poor-laws; asserting, that it is they that occasion that "abandoned and shameless profligacy" with which he charges her poor, compared with those of other countries; in doing which, his pitiable ignorance on the all-important subject on which he pronounces so confidently, is his only apology[1].

(19) In all countries, therefore, the rule suggested by Mr. Malthus, that, in estimating the prolificness of

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[1] See Dr. Chalmers's Civic Economy.

marriages, we are to omit, in great measure, the second and third marriages, is evidently fallacious; and the assertion, that the illegitimate births, especially in the countries he alludes to, in which the preventive check certainly prevails, is still more glaringly incorrect. But it is by no means for the mere purpose of pointing out mistakes in this or any other writer, on the subject of population, that the subject has been pursued to these particulars ; their errors, not bearing essentially on the great question at issue, (and they appear to me to be very numerous, and obvious to detection,) will be passed unnoticed. Those that have been the subject of consideration in this chapter are, however, not of that character; on the contrary, they are, whether considered morally or physically, important branches of the true principle of population. The deductions which the preceding remarks force upon the mind are these:—First, that instead of the power of population being so overcharged as to require perpetual resistance and repression, it demands, on the contrary, these accessions of after-marriages, notwithstanding that they are spoken of so slightly as to their influence on prolificness, to preserve mankind from rapid decrease and ultimate annihilation ; it being perfectly evident, that in those communities which increase the most rapidly, and, as it is supposed, by "procreation only," the additions thus made more than double the whole annual increment. So truly do the calculations of the great Author of nature harmonize with the properly regulated propensities, virtues, and affections of human beings!

(20) But a second, equally obvious, and more melancholy deduction, must close this chapter. It concerns the number of illegitimate children, and their effect on population. In countries where this

preventive check prevails, (and let the fact fall on the hearts of its advocates, or, rather, be hung like a millstone to the system, and sink it into the abyss to which it belongs,)—in countries, I say, cursed by this political "virtue," illegitimate children are necessary to the growth, if not to the preservation, of the species. In this case, Mr. Malthus's assertion, that "the "infant is, comparatively speaking, of no value to "society," is not more monstrous in a moral, than it is false in an arithmetical sense. Wherever the "virtue" in question exists and spreads, the aggregate "value" of such is the worth of the species, who, without such accessions, it is quite evident, would be doomed to decay and destruction. Could France, the annual number of whose births, if we may trust all her statistical authorities, is, compared with those of an age ago, on the wane, and her legitimate ones greatly so; and whose increase of population, now, therefore, simply owing to the improvement in the law of mortality, will, if it is to be continued, demand, ere long, an increase of births,—could France, I ask, dispense with 66,731 such annual accessions; Sweden, with 7,210; or Prussia with 58,576? It is the purpose of Nature to increase her numbers, and to sustain them; nor can she be easily baffled. Almost all the preventive check can do, by its impious interference, is to pollute and embitter the sources of existence; to divest life of all its virtues and its charities;

> To blur the grace and blush of modesty—
> Take off the rose
> From the fair forehead of an innocent love,
> And set a blister there!—

in fine, to degrade man to the level of the beast, in regard to his sexual connexions, and infinitely below the beast in his utter indifference as to their issue. In closing this part of the subject, I am disposed to add somewhat to the observations which have been made on the same head, in a former part of this work; but I shall forbear. I trust I have made the subject, as far as numbers are concerned, somewhat more familiar than it has hitherto been; and it is one of those cases in which mere numbers speak to the heart. The consequences of the preventive check, in this point of view, are palpable, and are such as Nature herself permits not to be evaded. Not to mention, then, the darker and more disgusting evils which this check has in its train, its public victims are known and numbered, amongst which the living are more to be pitied than the dead. It transforms the natural protectors of the sex into their betrayers, and, absolving the tempters, metes out wretchedness and ruin to the less-guilty tempted; and the totally innocent (because infant) beings, who, but for its unhallowed interference, would have been surrounded with affection, and invested with dignity, it consigns to misery, and brands with indelible disgrace: in fine, it converts the sacred institution of matrimony, on which hang all the duties and distinctions of civilization, into a positive curse, as it respects these unhappily numerous classes, by establishing a contrast which consigns them to lasting infamy; and, I repeat, it does all this gratuitously. With these facts, developed and established, let the assertors of the preventive check reconcile their conduct, in endeavouring to impose it on others, with their duty either to God or man: for myself, I had rather be amongst the number of its victims, than of its advocates.

CHAPTER XI.

OF THE PROLIFICNESS OF MARRIAGES, AND OF THE PROPORTION OF THE BORN WHO LIVE TO MARRY; AS DEDUCIBLE FROM REGISTERS.

(1) It is the purport of a distinct section of this work to shew how certainly and exactly Nature accomplishes her intentions on the great aggregate of her operations, however much she may conceal them in their individual diversification. Referring, then, to that part of the work for the establishment of general principles, it is the object of the present argument to prove that an adequate and consecutive number of instances are sufficient to establish those results, especially of a comparative nature, on which the real question as to the principle of population finally depends.

(2) That the average of these aggregate results is exact, as it respects individual instances, or that the latter are not liable to certain variations, no one ever supposed; but that they abundantly suffice to establish general, and especially comparative, results, was never doubted, till the introduction of a new theory of political economy and morality required that the method of computing them should be called into question. This is done in language about to be quoted, in which the usual mode of estimating the prolificness of marriages is presented to us as the subject of necessary discussion. It is applied to Dr. Price, who, as one of our early writers on the subject of population, demands our indulgence, and, as having taken the benevolent view of the question, our gratitude; but who, on the latter account, falls under the somewhat sar-

castic criticism of our main anti-populationist. I believe the accusation of ignorance, though so confidently urged against the former, has nevertheless been withdrawn; but, as I pursue the argument from no personal motives, (God forbid!) and, as the impression made by the more recent and popular writer may be still too generally prevalent, I shall not suppress my refutation of the following extraordinary positions.

(3) "He," Dr. Price, "did not," says Mr. Malthus, "understand this subject," (the method of computing the proportion of births to marriages,) "though he " has a long and elaborate note on it.—He merely " thought, that the list of annual births and marriages " did not, in all cases, express accurately the prolific" ness of marriages; but he does not seem to have been " in the smallest degree aware, that they had absolutely " nothing to do with it; and that, so far from being " merely inaccurate, it would be impossible from such " lists, unaccompanied by other information, to tell with " certainty, whether the prolificness in the marriages of " any country were such as to yield 2 births or 100 " births in the course of their duration. Such lists, " therefore, considered as expressing the prolificness of " marriages, must be rejected as perfectly useless; but, " considered as expressing the proportion of the born " which lives to be married, should be preserved as " highly valuable, and as giving a most interesting and " desirable piece of information[1]."

(4) I confess that all my attempts to reconcile the preceding passage to common sense have been ineffectual; so have theirs also to whom I have submitted it, whose minds were far from being clouded by any aversion to the system it is brought forward to support. The language is too plain to admit of any other inter-

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[1] Malthus, Essay on Population, pp. 228, 229.

pretation, than that the annual marriages and births are so far from indicating their usual relations in any country, that, for aught they express to the contrary, the proportions of the latter, compared with the former, may be two, or they may be fifty to one. Now this, on every possible view of the subject, is as erroneous a position as was ever advanced: bearing in mind that the period of marriage, and the issue resulting from it, though not contemporary, are more nearly so than any other events happening to the same individuals which at all affect the subject of population; and not, perhaps, on the general average, exceeding the term of nine years: it appears strange indeed, that this anachronism is objected to as fatal to all just calculations on the subject, by one who has, nevertheless, founded most of his own on events far more remote, and having necessarily less connexion with each other; instances of which have been already given, and others will be added. On referring to Dr. Price, I am convinced, that instead of his not understanding his subject, he comprehended perfectly, and expressed with his usual perspicacity, all that can be known about it, namely, that in a stationary population, the movements of which are uniform, the annual births, divided by the annual marriages, will accurately express the average prolificness of the latter; that in a retrograding one, (a case so rare as to deserve little consideration,) it will give that prolificness somewhat too great, and in an increasing one, on the contrary, too small; but the brevity of the average period of female prolificness will prevent this progression from operating to any great degree on the calculation.

(5) These positions of Dr. Price are, in fact, almost too clear to render either proof or illustration necessary. If we take the register of a community for a certain term (*twenty-five years* for instance,) the whole

of the births contained in it, divided by the whole of the marriages, give the average prolificness of the latter, as usually calculated. But, strictly speaking, a certain number of the births at the commencement of the register, belong to marriages previously contracted, and not therefore enrolled in it. On the contrary, all the marriages at its termination have not added their whole number of births. Now, it is plain that, to render this document critically exact, as to the prolificness of all the marriages contained in it, it is necessary to deduct the births at the commencement which do not belong to the registered marriages, and add those which are due to them at its termination. If the community has been exactly stationary during this period, these will be equal, and the usual method will therefore express the prolificness precisely; if it be decreasing, the births to be deducted will exceed in their number those to be added, and that method will then have given the prolificness too high; but lastly, if it be increasing, the births to be deducted will, on the contrary, be fewer than those that have to be added, and the prolificness as calculated by the register will appear too low. All this Dr. Price clearly comprehended; and he must have seen, likewise, that in a term sufficiently extended, all such rectifications would be incalculably trivial; while, even in short ones, the constant tendency of Nature to equalize her operations would, generally speaking, render them unnecessary. Seeing, then, that in all such instances as the foregoing, the great majority of the births and marriages registered actually belonged to each other, and that in others their proportions were relatively established by irreversible laws, it is quite true that "he did not seem to be in the smallest degree aware" that an examination of "the lists of annual births and marriages," had nothing to do with the subject of "the prolificness" of the latter, so that he could not gather from them whether they yielded "two or a hundred births each." The idea is preposterous. Dr. Price, I must repeat, perfectly understood this part of his subject, when he said that these annual records did not in all cases exactly express the prolificness in question[1].

(6) But if there be little inaccuracy in the result obtained from correct registers, as at present examined, there is still less when they are used for comparison, which is the most material purpose to which they can be applied, and almost the only one bearing upon the main argument of this work. In these comparisons between countries whose respective population is stationary, or equally advancing, the relative results will be strictly correct; and where that advance is unequal, the difference in the short period of time to which the average fertility of marriages is limited, will be so trivial as to render the rectification unnecessary.

(7) But in order to place this matter, which Mr. Malthus conceives had been unaccountably overlooked till his time, in a clear point of view, which will show, I think, that he alone has been bewildered upon it, I shall present it in the form of simple calculation. Suppose a population of 480,000 persons, amongst whom there shall take place, annually, one marriage in every 120, one birth in every 30, and one death in every 40 of the whole number; not contending that these are the precise proportions in any country, (though, perhaps, not differing much from those which exist in several,) but as fully answering all the purposes of an illustration as though they were exact; the following table will exhibit the progress of such a population, for a period of a quarter of a century.

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[1] Dr. Price, *Observations on Reversionary Payments*, vol. i., p. 265, note.

TABLE XXX.

EXEMPLIFYING THE USUAL METHOD OF ESTIMATING THE PROLIFICNESS OF MARRIAGES, FROM ACTUAL REGISTERS.

Year.	Population.	Annual Marriages.	Annual Births.	Annual Deaths.
1	480,000	4000	16,000	12,000
2	484,000	4033	16,133	12,100
3	488,033	4067	16,268	12,201
4	492,100	4101	16,403	12,302
5	496,201	4135	16,540	12,405
6	500,366	4169	16,678	12,508
7	504,505	4204	16,817	12,612
8	508,709	4239	16,957	12,718
9	512,948	4275	17,098	12,823
10	517,223	4310	17,240	12,930
11	521,533	4346	17,384	13,038
12	525,879	4382	17,529	13,147
13	530,261	4419	17,675	13,256
14	534,680	4456	17,822	13,367
15	539,036	4492	17,968	13,476
16	543,528	4529	18,117	13,588
17	548,057	4567	18,268	13,701
18	552,624	4605	18,421	13,816
19	557,229	4644	18,574	13,930
20	561,873	4682	18,729	14,047
21	566,555	4721	18,885	14,164
22	571,276	4761	19,042	14,282
23	576,037	4800	19,201	14,401
24	580,837	4840	19,361	14,521
25	585,677	4881	19,522	14,642

(8) Now, from an examination of the preceding table, it will appear, notwithstanding the imputation of elaborate ignorance cast upon him, that Dr. Price fully understood this part of his subject; thus, in the present instance, the population is advancing, and the prolificness, as calculated by the marriages and births of contemporary years, would be rather too low; but instead of these annual lists affording no clue whatever, whether the marriages in such a state of society produce, on the average, two, or one hundred children each, it will be found, even according to the method Mr. Malthus suggests, (who, assuming about four years to be half the period of female prolificness, prescribes that we should divide the births of any four consecutive years, by the marriages of the four immediately preceding ones,) that the difference will be only 3.37 per centum only; the individual prolificness being, according to the usual method of computation, four to a marriage, but, as calculated by the one suggested, 4.135; and this is the result, whether the births of the whole term, with the exception of those of the first four years, be divided by the marriages of that period, rejecting those of the four last years, or the marriages of any particular year be made the divisor of the births of the fourth subsequent one.

(9) But this mode of computation is not merely unnecessary for the purposes of comparison, it is inapplicable, excepting where the movements of the population exhibit great regularity, which is not often the case, more especially as it regards marriages: when there is any considerable or sudden fluctuation in the number of these, it will lead to errors far greater than those affected to be rectified. The reason of this, a little consideration will render plain. In the short average period of female prolificness, the

first year after marriage is usually twice as fruitful, at the very least, as the ensuing ones: this I have found to be the case in my synopsis of the peerage, and it is still more strikingly the fact in the lower ranks. Any fluctuation, therefore, in the number of annual marriages has a very sensible effect on the births of the ensuing year; and this will, generally, be found the case, on consulting any register where these events are regularly recorded. But the method now prescribed almost wholly omits this important consideration; for, in dividing the births of any four following years by the marriages of other four preceding ones, it is obvious, that in only one year (the middle one) can the marriages and the births be consecutive: in the three others, the sudden influence that any considerable variation in the number of marriages has upon the register of the births, is totally omitted; and this is often far greater than any which is produced during so short a term by the regular movement of the population. On this important consideration, the usual mode of estimating the prolificness of marriages, more especially if calculated upon a sufficient number of years, is preferable, and, indeed, more exact.

(10) I had constructed a table, with the intention of exemplifying this also; but it occurred to me, that it might be far more satisfactorily done by appealing to actual and incontrovertible facts. Turning to the censuses of England and Wales, I find that the marriages during the present century have been 1,742,517, and the births 6,133,973: if we adopt the method alluded to, which, as applicable to the whole term, I admit to be a correct one, we must deduct from the latter the births of the four first years, and from the former, the marriages of the four last; the numbers

will then be, of the marriages 1,369,100, and of the births 5,034,407, which latter, divided by the former, will give 3.67, as the real prolificness of marriages during the term in question, according to the registers, instead of 3.52, as obtained by the usual method, —a difference of about 4 per cent. only; an inaccuracy which, I repeat, would, in great measure, disappear, if the censuses were used for the purpose of comparing the prolificness of England with that of other countries, or times, in which the population also advanced, and where the prolificness had been calculated on the customary mode. But let us see to what greater errors, in all respects, the adoption of the proposed rule, as applied to short periods, as it hitherto has been, must inevitably lead, especially on those sudden movements in the population which are frequently occurring, and which render such calculations more interesting and important. One of these is particularly observable in the registers of England during the period specified, commencing at the year 1814. Now, to estimate the prolificness of marriages in the four preceding years, namely, 1810, 1811, 1812, and 1813, by the births of the four subsequent ones, 1814, 1815, 1816, and 1817, is evidently to reject, excepting for one year (1814), the marked effect which the annual marriages have upon the births of the next succeeding years, and will, therefore, on my reasoning, lead to gross error in this, as in all other instances, whenever there is any considerable fluctuation in their number; and such is here the fact. Mr. Malthus rejects the idea "of the women of a country becoming, all at once, "more prolific than usual[1];" but this would have been wonderfully the case here, had his method of computation been a just one; for it gives the prolificness as high as 3.94—a palpable error in excess, compared with the fecundity of the period, however calculated, of about eight per centum; whereas, as usually computed, it amounts to 3.62, varying hardly at all from the exact truth, as ascertained on the most correct principle of computation, when applied to the whole term. Another striking instance appears in 1802, and the three subsequent years, compared with the four preceding ones, from which, almost precisely, the same results are deducible. But I shall not dwell upon it, as it takes us out of the term specified. On the other hand, if the preceding observations are just, and the examples adduced, conclusive, any marked diminution in the number of marriages, at a particular period, must render Mr. Malthus's method of computing the prolificness of marriages equally erroneous in the opposite extreme. Few such cases, happily for England, occur in our registers; the only one extending to the period prescribed, (four years, and even this falls short of it,) appears to be that commencing after the four years of suddenly increased marriages, commencing with 1802; and comprehending, therefore, the years 1806, 1807, 1808, and 1809. Now, to estimate the prolificness of this period, by the method suggested, would be to divide, by the marriages of 1802, 1803, 1804, and 1805, amounting to 350,099, the births of the four subsequent years already mentioned, which amount to 1,188,286, which it will be found would give the rate of prolificness during the term at 3.39 only, varying it, according to this mode of computation, from 3.94, or more than sixteen per centum, in so short an intervening period; a conclusive demonstration of the utter fallacy of the principle upon which it is formed, especially on Mr.

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[1] Malthus, Essay on Population, p. 228, note.

Malthus's notion, with whom the equal prolificness of marriages is an essential and often-repeated position. The common method gives the prolificness, at the period in question, as very nearly 3.6, the number of marriages having been 330,294, that of the births, as before stated, 1,188,286; being less than that of the average of the whole term by only two per centum; a difference unlike the former, in being quite reconcileable with the effect of those variable causes which are in constant, though latent operation.

(11) Thus, I think, it is fully proved that the mode of computation laid down by Mr. Malthus is necessarily incorrect, both in its principle and in its application; and, in a population where the movements are otherwise than regular, (and where is the community in which such is not the case?) it not only may, but must, lead to conclusions far more erroneous than those it is meant to correct. And it must be further observed, that this erroneousness is perfectly distinct from any considerations as to whether the registers are correct or otherwise; were these scrupulously exact, population fluctuating as it does; it is inherent in the proposed mode of computation, and the inevitable consequence of its adoption.

(12) If, then, any alteration in the general method of calculating the prolificness of marriages be deemed necessary, it must be by more closely connecting the marriages of any years under consideration, with their immediate results, instead of disconnecting and losing sight of the latter altogether. Hence, I am persuaded, that, in any given year, the number of its marriages, compared with its conceptions, or with the births that take place the year after, will, on the whole, be found to be a far better method of determining the question of prolificness than the one proposed; such marriages

always bearing a certain average relation to the circumstances of the society in which they take place, any deviations from which being attended with a corresponding influence on the number of the births in the year immediately succeeding. If more years than one be similarly calculated, (the marriages of any four consecutive years, for instance,) with the births of an equal term, one year later the chance of correctness may be perhaps greater; to which calculation, if a due allowance be made for the advance of the population left unaccounted for, the result will, I think, have some claim to theoretical correctness. Other methods, it will be seen in the sequel, have likewise been resorted to, where the subject has required considerable precision: positive and actual certainty, however, is evidently unattainable, in any form of computation possible to be adopted. Meantime, for most of the purposes to which registers are usually applied, and especially for those of comparison, the mode usually adopted is not only abundantly sufficient, but far preferable to the one proposed.

(13) So much for the different methods of determining the prolificness of marriages from annual registers. But as Mr. Malthus regards it as a discovery, that the period which intervenes between marriages and their proper births, short as it is on the average, and always necessarily limited, is nevertheless fatal to any calculations deduced from annual lists, it is passing strange that he has made another discovery on a directly opposite principle, and has regarded such lists as furnishing the exact proportions in which results occur which are far more remotely and uncertainly connected. In a word, he has rejected the calculation of prolificness founded upon annual marriages and births, on account of their not being strictly contem-

porary; and yet asserts, that the proportion of the born who live to marry may be deduced from such annual lists, though it is evident that the connexion of the events is much less apparent, far more distant, which indeed often vary almost as wide as the limits of human existence.

(14) The writer in question has, however, expressed himself much at large, and in terms to me not very intelligible, on this latter point; but he sums up the discovery in these terms: "The number of persons "annually married, compared with the number of "annual births, will accurately express the number of "the born which lives to be married; and the difference "between them, the proportion of the born which dies "in infancy and celibacy. For instance, if the average "proportion of annual marriages to annual births, in "any country, be as 1 to 4, this will imply, that out of "four children born, two of them live to marry, and "the other two die in infancy and celibacy. This is "a most important and interesting piece of information[1]." It would be something more than interesting, it would be miraculous, if it were true; and incalculably important, moreover, to those who fear an increase in population, for it would consign almost every country upon earth to inevitable decay and desolation. But nothing can exceed the absurdity of this conclusion; this is indeed to make events synchronous which are, in the order of nature, widely apart, and to deduce relations from them which have no necessary existence whatsoever. It happens, and by mere accident, that the preceding Table does give the exact proportion specified, namely, 4 births to 1 marriage; but does it, therefore, prove, as this author asserts, that in such a state of things, two only of the born live to marry, and

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[1] Malthus, Essay on Population, p. 226.

the other two die in childhood and celibacy? GOD forbid! Fix the average age of marriage as you please; say, for example, at the 25th year, and advert to the calculation referred to. Do the 4881 marriages at that period, contracted, of course, by 9762 individuals, and standing opposite the 19,522 births of the same year, prove, as he asserts, that only half of the births live to marry, and that the remaining half die in childhood and celibacy, in such a community? On the contrary, on the assumption relative to the nubile age, before mentioned, the 9762 persons married that year, result from the 16,000 births which occurred in the year 1, leaving, therefore, only 6238 individuals as the number dying in infancy and celibacy, and 9762 as the proportion surviving to marry; the latter being upwards of two thirds, instead of one half, as the proportion of the born which lives to marry, which proportion would appear still more favourable in a population increasing with greater rapidity; but in no imaginable case could "this interesting piece of information" be true, except in the instance of a precisely stationary population, where, if such a state were in existence, it would be obviously no information at all; or else in one in which the marriages and the deaths should all take place in the year of nativity. So glaring, indeed, is the mistake in question, that I could hardly bring myself to believe that more was meant by the discovery which is dwelt upon with such visible complacency, than that the number of the married, in any given year, had been born, and were then alive to marry; but this is impossible, for the information would then be precisely of the character, and just as interesting and important as that communicated in Launce's soliloquy, "This dog is himself, and I am me."

(15) Further misapprehensions relative to the use

of registers, into which the same writer has fallen, it is necessary to notice, with a view to the calculations of a subsequent part of this work. After having applied the erroneous principle just animadverted upon at large, he goes on to say; " In towns where " there is a great mortality in early life, if no marriages " were registered but of those who were born in the " place, the proportion of annual births to annual mar- " riages would be greater than the proportion of " children born to each marriage in the course of its " duration, and would amount, perhaps, to 6 or 7 to 1, " instead of 3 or $3\frac{1}{2}$ to 1. In Leipsic, the proportion " of births to weddings is only 2 and $\frac{1}{10}$ to 1; and " Susmilch, supposing this to imply that there were " only 2 and $\frac{1}{10}$ children born to each marriage, " puzzles himself to account for this extraordinary " unfruitfulness; but the appearance in the registers, " without doubt, arises either from a great accession " of strangers, or from a custom among the inhabitants " of the neighbouring country of celebrating their " marriages in the town[1]." The latter reason, if more than a supposition, has, I confess, a direct bearing upon the question; but the former, which it is his especial purpose to advance, is founded on an entire mistake, though he has again expressed so much confidence in announcing it. To proceed with the quotation: " At Geneva, where the registers are supposed to be " kept with considerable care, the number of mar- " riages, from 1701 to 1760, was 21,493, and the " number of births, in the same period, 42,076; from " which it is inferred, that each marriage had yielded, " on an average, less than two children. The author " of a valuable paper in the Bibliothèque Britanique, " who mentions these numbers, naturally expresses

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[1] Malthus, Essay on Population, p. 235.

" some surprise at the result, but still adopts it as the " measure of the fruitfulness of the Geneva women. " The circumstance, however, arises undoubtedly from " the constant influx of the new settlers, whose mar- " riages appear in the registers, but not their births. " If the number of children from each individual " mother were traced with care in the bills of mor- " tality at Geneva, I am confident that the result " would be very different[1]." Again, in a note in the succeeding page, he says, " In places where the pro- " portion of annual births to annual marriages is much " influenced by new settlers, or emigrations, few ac- " curate inferences can be drawn from them in any " way. They neither express the fruitfulness of mar- " riages, nor the proportion of the born which lives to " be married[2]."

(16) The last idea, that the annual lists express the proportion of the born that lives to be married, has been already sufficiently exposed; and I think it will be as little difficult to shew that, in calculating the fruitfulness of marriages in a town, the notion of its being necessary to take into consideration whether the married are natives or not, is, notwithstanding the confidence with which it is repeated, full as absurd. In the former case the marriages of any given year, though not as compared with its births, do indicate, though in a very variable and uncertain proportion, the births of a former period which have survived to be married; whereas, the enquiry whether the marriages in any place are contracted by natives, or by advenæ, or both, and in what proportion, has no possible connexion with the fruitfulness of such marriages, however calculated, though this author seems to imagine that it would have the effect, were it pursued, of

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[1] Malthus, Essay on Population, p. 235. [2] Ibid., p. 236, note.

proving from the same registers that each marriage had produced 6 or 7, instead of 3 or 3¼ children.

(17) As part of the ensuing argument will turn upon the comparative fruitfulness of marriages in towns, it is necessary to clear away these doubts also, though I think Mr. Malthus has "puzzled himself" far more than has Susmilch, and on an occasion in which it requires, one would have thought, considerable effort to be obscure. Suppose, then, in Leipsic or Geneva the general proportion of births to marriages be 3 to 1, is it possible, especially for those who assign an unvarying average fecundity to females, that any given number of settlers marrying, and having their children in such town, and whose marriage and its offspring would consequently be just as regularly registered as those of the natives, and being also subject to the same law of Nature, and placed under the same circumstances, must be equally prolific,—is it possible, I say, to imagine that such accessions could make the slightest difference between the proportion of marriages and births? No more than these proportions could be varied amongst the married couples of the places from whence they proceeded, because they had married elsewhere. The actual number of both marriages and births would, unquestionably, be affected in both cases, but it is as perfectly clear that the relative proportion would not be in the least so. It is irksome to dwell upon a point so indisputably plain, but here, strange to say, it seems necessary. Suppose, then, to put the matter in the simplest form, a place to contain a single married couple, born upon the spot, and who have four children, and whose marriage, as well as the births of their children, are duly registered: suppose that a pair of settlers proceed to the place, marry in it, and are similarly fruitful, and their mar-

riage and children are also registered: the fruitfulness of marriage, whether calculated on the native or the "emigrant" couple, or on both, is the same; nor is it imaginable that it should be varied by the circumstance of the latter having been themselves born elsewhere. If, however, as Mr. Malthus seems to suggest, the births of the new comers ought in these cases to be added to the registers in order to determine the question, it is plain that such a ridiculous falsification of them would lead to the error of giving the prolificness of marriages too high. Now, if these native couples be a thousand instead of one, and the in-comers as many, or whatever be the proportion of each, if their children, of both classes, are born to them where they marry, and if the registers equally record these events, (and in one at least of the places Mr. Malthus adduces, it seems they are kept with much care,) the calculation cannot be incorrect on account of these accessions, whose place of birth has as little to do with it as the name they received at it.

(18) There is only one circumstance which can at all be considered as tending to diminish the apparent fecundity of the marriages in towns, namely, the custom that may prevail, in some few places, of the inhabitants of the neighbourhood proceeding to such places to celebrate their nuptials; but the legal, as well as other obstacles which are interposed, as it respects the bulk of the population, prevent, as I should conceive, this practice from being sufficiently prevalent to have any very sensible effect in many such places. In the metropolis of this country this circumstance is known to affect the registers, especially of the bordering counties; as to its own, the fact about to be mentioned may probably balance the effect that would otherwise be produced. Concerning the generality of places to

which settlers repair in considerable numbers, or, in other words, most of the large towns in the world, the fact of no inconsiderable number of couples already married elsewhere, repairing thither with a view to better their circumstances, to provide for and fix, or to follow, some branch of their families, is unquestionable; and, comparatively speaking, few of those who thus remove are at an advanced stage of life. It follows, therefore, that many of the married persons proceeding to such places have children after their removal thither; and in all such cases (and they are obviously numerous, and cannot be balanced by those of an opposite description) the births of these subsequent children are of course registered in the place without the marriages from which they sprung; and in proportion to their number will the register of any such towns exhibit too large, instead of too small, an annual proportion of births to marriages.

(19) Contrary to what is usual, I have not spent as many words in refuting the foregoing misconceptions as have been used in advancing and applying them; but, as they would have a strong bearing upon some of the subsequent calculations, and in the mean time are necessary and main proofs of the theory I am rebutting, I may be excused in still further pursuing the subject; and, by means of another numerical exemplification, completely, I hope, settling the question. Assuming, then, the population of a town, independently of these accessions, to be stationary (a sufficiently favourable supposition), let us take the proportion of births to a marriage as 3 to 1: the first in the year succeeding marriage, and the remaining two at intervals of two years, supposing these circumstances common to both natives and advenæ. The former being stationary, their marriages and births may be expressed

by the same figures; those of the latter, being the only matter of dispute, may be expressed by letters, which will at once serve the purposes of distinction and calculation. Let the annual marriages of the natives be 30, and the births resulting from them consequently 90; let the individual marriages of the emigrants be one thirtieth part of the former, and represented by the capital letters A, B, C, &c., and the births proceeding from these, in the same proportion, be given in small letters, a, a, a, b, b, b, c, c, c, &c. The Greek letters serve to connect the marriages of the native inhabitants with the offspring resulting from them. The question will then be thus represented and determined.

TABLE XXXI.

SHEWING THAT THE MARRIAGE OF EMIGRANTS IN THE PLACES TO WHICH THEY REPAIR, DOES NOT AFFECT THE ACCURACY OF THE REGISTERS, AS EXPRESSING THE PROLIFICNESS OF MARRIAGES.

Years.	Marriages of Natives.	Marriages of Advenæ.	1st Children of Natives.	2nd Children of Natives.	3d Children of Natives.	1st Children of Advenæ.	2d Children of Advenæ.	3d Children of Advenæ.	Total Number of Marriages.	Total Number of Births.	Prop. of Births to Marriages.
1	30 α	—	—	—	—	—	—	—	30	—	—
2	30 β	—	30 α	—	—	—	—	—	30	30	—
3	30 γ	—	30 β	—	—	—	—	—	30	30	—
4	30 δ	—	30 γ	30 α	—	—	—	—	30	60	—
5	30 ε	—	30 δ	30 β	—	—	—	—	30	60	—
6	30 ζ	—	30 ε	30 γ	30 α	—	—	—	30	90	3
7	30 η	—	30 ζ	30 δ	30 β	—	—	—	30	90	3
8	30 ϑ	A	30 η	30 ε	30 γ	—	—	—	31	90	2.9
9	30 ι	B	30 ϑ	30 ζ	30 δ	a	—	—	31	91	2.93
10	30 κ	C	30 ι	30 η	30 ε	b	—	—	31	91	2.93
11	30 λ	D	30 κ	30 ϑ	30 ζ	c	a	—	31	92	2.96
12	30 μ	E	30 λ	30 ι	30 η	d	b	—	31	92	2.96
13	30 ν	F	30 μ	30 κ	30 ϑ	e	c	a	31	93	3
14	30 ξ	G	30 ν	30 λ	30 ι	f	d	b	31	93	3
15	30 ο	H	30 ξ	30 μ	30 κ	g	e	c	31	93	3
16	30 π	I	30 ο	30 ν	30 λ	h	f	d	31	93	3
17	30 ρ	K	30 π	30 ξ	30 μ	i	g	e	31	93	3
18	30 σ	L	30 ρ	30 ο	30 ν	k	h	f	31	93	3
19	30 τ	M	30 σ	30 π	30 ξ	l	i	g	31	93	3
20	30 υ	—	30 τ	30 ρ	30 ο	m	k	h	30	93	3.1
21	30 φ	—	30 υ	30 σ	30 π	—	l	i	30	92	3.06
22	30 χ	—	30 φ	30 τ	30 ρ	—	m	k	30	92	3.06
23	30 ψ	—	30 χ	30 υ	30 σ	—	—	l	30	91	3.03
24	30 ω	—	30 ψ	30 φ	30 τ	—	—	m	30	91	3.03
25	30 ϖ	—	30 ω	30 χ	30 υ	—	—	—	30	90	3
26	30 ȣ	—	30 ϖ	30 ψ	30 φ	—	—	—	30	90	3
—	—	—	30 ȣ	30 ω	30 χ	—	—	—	—	90	—
—	—	—	—	30 ϖ	30 ψ	—	—	—	—	60	—
—	—	—	—	30 ȣ	30 ω	—	—	—	—	60	—
—	—	—	—	—	30 ϖ	—	—	—	—	30	—
—	—	—	—	—	30 ȣ	—	—	—	—	30	—
	780	12	780	780	780	12	12	12	792	2376	3

(20) The above table, which must be considered as commencing at the 6th and terminating at the 26th year, (the five preceding and five subsequent ones being only given for the purpose of completely tracing all the births to all the marriages throughout,) fully exhibits the subject in every respect. The 6th and 7th years, as do also the 25th and 26th, shew the prolificness of marriages uninfluenced by any accessions whatever, which is three births to each wedding: the seven years from 13 to 19 inclusive, present the same fact under the fully developed operation of one thirtieth part of the weddings being caused by emigration; still, to the discomfiture of the supposition I am controverting, the prolificness of weddings remains three children each. The other sections of the table, viz., from 8 to 12, and from 20 to 24 inclusive, are given to exemplify the effect such accessions had when they first commenced, and which they would produce were they to terminate; the former presenting the average prolificness as somewhat diminished, the other as somewhat increased, but balancing each other, and still giving for the whole number of marriages, whether of natives or in-comers, three children each. Finally, the sum of the births throughout the whole term, compared with that of the marriages, whether those of the strangers are included or whether they are excluded, is the same, three to one. It is the middle section, however, namely, that from the 13th to the 19th year inclusive, in which the native population is annually receiving an equal number of these effective accessions, that demonstrates the fact that so long as the marriages and births of in-comers are registered, they have not the least influence on the average fecundity of marriages: and if the period were extended from the seven years which it includes, to the sixty of which Mr. Malthus

speaks when referring to the registers of Geneva, the result must be obviously unaltered.

(21) The above calculations have been made on the supposition of a stationary population, and an equal number of annual settlers; and it surely will not be contended that if both or either of these are increasing, that the nature of the demonstration is in the slightest degree affected, which is simply this,—that in estimating the prolificness of marriages the birth-place of the parties is a wholly extraneous consideration; and that the elements of the calculation are, only, the number of the marriages, and the number of the births resulting from them.

CHAPTER XII.

OF THE EFFECTS OF MORTALITIES ON THE NUMBER OF MARRIAGES.

(1) THE subject of this chapter is of paramount importance in relation to the question at issue, and is one of those upon which the anti-populationists have again fallen into the greatest numerical errors. Its determination will at once furnish a test of the truth or fallacy of the theory they espouse, as well as of the contrary one already partially developed, and about to be more fully explained. It therefore demands our utmost attention, and will repay it. The nature of the inquiry will indeed necessarily invest the mind with serious and gloomy reflections; but these will give place to more cheering impressions, and a light will at length break from the darkness of the tomb, which will enable us to read the principles of eternal benevolence even from the records of mortality.

(2) The position about to be submitted to the test of truth is this; that the number of marriages is influenced by the number of deaths, the latter "making room for[1]" and "regulating" the proportion of the former, at least "in countries which have been long fully peopled[2];" which, according to the same authorities, is the condition of most of the nations of Europe; and that even in those only "tolerably well peopled, "death is the most powerful of all the encouragements "to marriage[3]." This idea is repeated in every variety of phrase, and its truth perpetually re-asserted by the

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[1] Malthus, Essay on Population, p. 244. [2] Ibid., p. 244. [3] Ibid., p. 247.]

advocates of the prevailing theory of population: many arguments in its favour have been remodelled, and some, I understand, entirely withdrawn, but this has invariably kept its place, and is to the present hour represented as its principal demonstration; while the conclusions deduced from it are as revolting as the doctrine attempted to be established.

(3) But a reference to facts will enable me to prove not only that the assumption in question is not true, but that the very converse of it is so; namely, that an excess of deaths is so far from causing a proportionate increase of marriages, that it occasions a diminution in them. An appeal, not to particular or garbled documents, but to those which Mr. Malthus himself has selected for a contrary purpose, and the whole of them, will decide this question, not according to some abstract and elaborate calculation, but by the simplest rules of arithmetic.

(4) Nor will the conclusion, opposite as it will be found to the dogmas now delivered with such persevering confidence, be otherwise than such as ought to be reasonably anticipated, if we sufficiently advert to the structure of civilized society, or to the experience of human beings in every age of the world. Before entering, therefore, upon the numerical demonstrations contemplated, that moral evidence may be well appealed to, which the very nature of the subject amply affords, and which is, of itself, abundantly sufficient to determine the question. If, as the anti-populationists contend, Europe, generally speaking, is already over-peopled; if all the avocations of life are pre-occupied and full; and if there is a constant tendency in its people to a still further increase, beyond the means of subsistence; and admitting, at the same time, what is often insultingly denied, that

human beings are distinguished from the brutes by the exercise of forethought and prudence; I say, allowing all this, and it can hardly be denied, but that any considerable and unusual diminution of the inhabitants of any place, by deaths, would be the signal for an immediate and proportionate increase in the number of its marriages. But if, on the other hand, the world is not over-peopled, with reference to the provision it is capable of producing, as the effect of human industry; if mankind, in consequence of that mutual dependance by which Nature has ordained they should be united together, become necessary to each other, in proportion to their numbers, especially in a state of civilization, and thereby, in the true sense of the term, make room for each other; if this increase does not occasion a loss or diminution in the individual shares of the necessaries and comforts of existence, but is the means of securing and enlarging them; and if these consequences are manifest in the general experience of mankind, then will a replenished state of population, and not a season of mortality, be that in which the greater number of marriages will take place. This argument is insisted upon in another place, but it may be repeated, on the present occasion, that in all the pursuits of human industry, in all the avocations of social existence, human beings create employment for each other; and that not to some limited and arbitrary extent, which supposition is the grand error of the system I am opposing; but, in proportion to their numbers, and even in a super-proportion, the habits of an increasing community creating those artificial wants which, in the progress of civilization, are constantly becoming necessaries of life: numbers of people, therefore, as De Foe rightly argues, encouraging employment far beyond that which can be demanded in a scanty population. There may, indeed, be some exempt cases, as in the instance of flagrant misgovernment; or, as it regards those offices and situations in a country which its institutions have fixed and limited in number, without any reference to the progress of its population; and in which, it is true, the death of present possessors can alone "make room" for waiting aspirants; and it is not unlikely that the early professional habits and feelings of one of the most strenuous assertors of the theory I am opposing, may have forced the idea upon his mind, as well as given it entrance to that of many others, similarly circumstanced, where it is known to be espoused, and may have suggested its application to the general condition of society. As it respects the mass of mankind, however, it is difficult, if not impossible, to conceive but that the position, for which I am contending, must be true, which is, that human beings, in a state of civilization, are, in proportion to their number, essential to each other; and, in fact, that it is the living, which "make room" for each other, and not the dead. Arguments, derived from a contrary and diminishing state of society, would, perhaps, be still more forcibly applicable to the subject: were we to trace every step of such a retrogression, we should find that the fewer mankind became, the less room there would be for the remainder; till all that would be wanted by the last miserable relic of humanity would be a grave amidst the boundless desolation of Nature.

(5) In addition to the argument suggested by these views of society, pursued more at large elsewhere, I cannot forbear briefly appealing to those feelings and sympathies of our nature which, during the whole course of the present investigation, I have ever found to be indicative of truth. The irrecon-

cileableness with the system I am opposing, I have always regarded as no slight proof of its erroneousness. Thus the assumption I am now controverting, and am about finally to disprove, requires us to believe, that in sweeping epidemics, in seasons of unusual mortality, which are those of general calamity, the survivors, as regardless of the memory of the recent dead as indifferent to the sorrows and sufferings of the living, and insensible even to the peril of their own situation, should rush into the sexual union, like the beasts that perish, with such indecent haste, that—

> ——— The funeral baked meats
> Do coldly furnish forth the marriage table.

The Hymen of such a system lights his torch at the funeral pyre, and makes the charnel-house his temple. So "very sudden and prodigious," as we are informed, is "the effect of great mortalities on the number of "marriages[1]." This presents, indeed, a very unfavourable picture of human nature; but, happily, it is one which is wholly untrue.

(6) But here let me not be misunderstood. I deny not, that it is in the order of Providence that human beings should succeed each other; that, like the waves upon the shore, rolling up and breaking, and returning to the bosom of the deep, generation after generation should appear, flow up to their appointed bound, and sink again into the abyss of Eternity, in a regular and never-ceasing succession. But then, Nature has ordained the order, and fixed the intervals of their appearance, by laws which she labours to maintain; nor is it in the interruption of these, whether by preventing, as far as possible, the multiplication of the species; by pushing the generations far apart, or by anticipating the period, or increasing the proportion of mor-

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[1] Malthus, Essay on Population, p. 254.

tality, that their interests, individually or collectively considered, are to be promoted: on the contrary, it is where society is the most replenished with numbers, that the cup of their enjoyments runneth over; and that the state which is at once the source and the evidence of their happiness—marriage—most prevails.

(7) Let us now turn from arguments to facts; and first, to those which Mr. Malthus has himself selected; and, by which, in great measure, he professes to have proved his point, and still maintains it. The document referred to by both of us, is, then, in the 21st Table of the first volume of Susmilch's "Gottliche Ordnung," a work which, with some little delay and difficulty, I obtained; being convinced, from its title, that it was not very likely to furnish arguments in favour of such a theory as that I am opposing; and having, moreover, an increasing disinclination to trust implicitly, and without personal examination, to quotations, however formally given: an impression which, I think, the reader will have been already convinced I am fully justified in retaining.

(8) Mr. Malthus, the author to whom I have been hitherto almost exclusively alluding, gives a kind of abridgment of the table in question, which, in the original work referred to, contains the marriages, births, and deaths, for Prussia and Lithuania, from the year 1692 to 1757, inclusive. On this table, as the very foundation of his theory, (at least as far as its main proof, the position now under consideration, is concerned,) he comments at large: but to quote a few sentences only; he says, "The year 1711, immediately succeeding the great plague, is not included "by Susmilch in any general average; but he has "given the particular numbers, and if they be accurate, they shew the very sudden and prodigious

" effect of a great mortality on the number of mar-
" riages. Susmilch," he continues, " calculates that
" above one third of the people was destroyed by the
" plague; and yet, notwithstanding this great diminu-
" tion of the population, it will appear, by a reference
" to the table, that the number of marriages in the year
" 1711 was very nearly double the six years preced-
" ing the plague[1]." He goes on, reasoning upon the above assertion, for several pages; and though his author has called his attention to a fact, (which ought to have instantly detected the error into which it is quite clear he has fallen,) namely, the fruitfulness of marriages after the plague, which, admitting his interpretation of the table, would be plainly the reverse of truth, still he persists in his view of the fact; accounting for this vast increase in the annual number of marriages at this period, on his own principle; by the " plenty occasioned by the plague."

(9) The best answer to all this reasoning, will be to transcribe, most exactly, the section of the table so much referred to, and which, I cannot but think, Mr. Malthus has very unaccountably omitted. With the headings of the columns, as in the table, transferred to this part of it, in order to render the particulars intelligible, it stands in Susmilch precisely thus[2].

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[1] Malthus, Essay on Population, p. 254.

[2] Susmilch, Gottliche, Ord. th. i., tab. xxi.

TABLE XXXII.

Jahre.	Getraute Paare.	Getaufte.	Geſtorbene.
1709	5477	23977	59196 Peſt.
1710	" "	" "	188537
			Sum. 247733
1711	12028	32522	10131
S. 3 J.	17505	56499	" "

(10) Nothing, one would imagine, can be plainer than this part of the table. Indeed, it is so expressed as to render any mistake, more especially the one under consideration, almost impossible. The brackets which connect 1710 and 1711, as far as the births and marriages are concerned, shew, just as plainly as the bracket which connects the deaths of 1709 and 1710, that two years are unquestionably included in both instances: but to end all doubt upon the matter, in the total line of the marriages and births are placed these characters, S 3 J. or Summe drey Jahren. not S 2 J. If, therefore, one year only of marriages and births is included in the bracketed total of 1710 and 1711, amounting to 12,028 of the former, and 32,522 of the latter, as Mr. Malthus reads, or rather misreads, the table; then he holds that Susmilch reckons one and one, THREE. Without implicating Mr. Malthus's intentions upon the occasion, justice to my subject compels me to assert, that so gross a misrepresentation of

any author has been rarely attempted; nor, moreover, one more obviously absurd. Had the information been derived from some ancient manuscript, or partly obliterated document, in which the brackets and the totals were rendered illegible; even then it would require us to suppose, that during the whole of the year 1710, there were, in all Prussia and Lithuania, neither a single marriage nor a single birth; but, still, that the conceptions of that same year were so numerous, as to raise the births of the ensuing one to a height without any previous parallel, although no marriages, as before stated, were supposed to have been celebrated at that period, and so large a proportion of those previously subsisting had been dissolved by the tremendous contagion that then prevailed. In plain truth, the omissions, of which the brackets are clearly explanatory, are perfectly conclusive in this case; and while signs and figures have any settled meaning among men, the eye instantly rejects a misinterpretation, which, even were it otherwise, that sense could never reconcile to the understanding, nor the united evidence of both to the heart.

(11) I shall not follow Mr. Malthus through the many pages of comments on his extraordinary misstatement; in perusing which, one's surprise constantly heightens that the error did not become obvious to himself, especially as he has calculated, in a note, the proportions it involves, which have neither the semblance, nor, indeed, the possibility of being true. "The number of people before the plague," he says, "according to Susmilch's calculation (vol. i. ch. 9, "sect. 173), was 570,000; from which, if we subtract "247,733, the number dying in the plague, the "remainder, 322,267, will be the population after the "plague, which, divided by the number of marriages,

"and the number of births for the year 1711, makes "the marriages about one twenty-sixth part of the "population, and the births about one tenth part[1]." One in every ten born—one in every thirteen married! These proportions would have been utterly impossible, had the epidemic, during this dreadful visitation, miraculously passed by, untouched, all the unmarried youths and maidens of the country. In, however, the theory I am opposing, in support of which the plainest facts must give way to suppositions, be they ever so absurd, I find that the assumption is given as a proof of the prevalence of the preventive check, before the contagion; but the question is, did the proportion of marriages before that event indicate its existence at all? Quite the reverse; if we take the population, as given to us, at 570,000, and divide it by the average number of the births of the six preceding years, which, according to Susmilch, is 26,896, these give 1 birth in about every 21, necessarily implying a very great proportion of marriages; and such we find to be the case; their mean number during the same terms was 6082, or 1 in about every 93; proportions which prevail, at present, in no country upon earth, no, not in America; nor would they have been possible here, but for that inferiority in the mean duration of life which then prevailed; the effect of which, on such calculations as the present, has been already proved and exemplified. However Susmilch, prompted by a sincere and benevolent wish to further the increase of mankind, may have argued, or whatever Mr. Malthus, influenced by contrary views of population, may have asserted, it is perfectly certain, on the very face of the documents presented to us, that the preventive check did not prevail in Prussia, previously to the great plague; and I prove this, by an appeal to one of Susmilch's own tables; the 21st in the third volume. In this, the proportion of the living, in a kingdom at large, resulting from every 1000 annual births, is calculated to amount to 32,310: of these, 526 would, it appears, annually attain their twentieth year; were all these to marry, it is obvious that only 263 first marriages in every 32,310 individuals could take place, or about one in 123; supposing one sixth more to be added for the proportion of second and third marriages, then one in 105 would be the proportion; but if we allow as many as a fourth, then one marriage in 98 would be possible. But the marriages in Prussia and Lithuania, previously to the plague, according to the table which Mr. Malthus has so much relied upon, exceed even the last proportion, and are 1 in 93; and still he labours to prove, that the preventive check was so operative at this period, as to accumulate the number of the unwillingly single so greatly, as that, the moment this dreadful scourge had "made room," to use his own terms, nearly twice the number of annual marriages occurred, amongst only the remaining two thirds of the population. But when the reader recollects, were all the inhabitants to have married in their twentieth year, and one fourth of them to have married twice, that the results would not have equalled those presented in the table; the difficulty with him, I am persuaded, will be of a very opposite nature to that of accounting for the preventive check. I am persuaded Susmilch must have underrated the population. It is unnecessary much further to pursue an argument that presents, as its strongest proofs, a series of impossibilities. To conclude, then, my observations on that section of the table in question, which has been deemed so important to the arguments, and which yet has been so egregiously mistaken; the only apology I can suggest for the author referred to, is an evident mistake, which is made at the end of the table, where the number of the marriages and the births given in the body of the table, as those of 1709, is given as those of two years. Indeed, he seems now sufficiently aware of the error; and, but that he still persists in the equally fallacious doctrine, originally founded upon it, I should, therefore, not now have adverted to it. In a note in a subsequent edition, he says, "It is possible there may be some mistake in the "table, and that the births and marriages of the "plague years are included in the year 1711, though, "as the deaths are carefully separated, it seems very "strange that it should be so." I must just remark, however, that this reasoning can have no effect where the document is seen; but he proceeds thus: "It is, "however, an error of no great importance. The "other years illustrate the general principle[1]." This is, altogether, a most singular explanation. In the first place, I leave it to the reader, whether there is the least appearance of error, or even ambiguity, in the section referred to, which I have copied with scrupulous fidelity, except in these misrepresentations of its purport. The next idea, that it is of no great importance whether one or two years are really included in the numbers quoted, though the deduction which occupies so large a part of the chapter, and indeed pervades the whole work, is professedly derived from the assumption of the former extraordinary fact, is really most surprising. He thirdly asserts, that the other years of this table (which he continues to omit inserting at large) are sufficient to illustrate the general principle, namely, that of

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[1] Malthus, Essay on Population, p. 254, note.

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[1] Malthus, Essay on Population, vol. i., p. 501, note.

“ the very sudden and prodigious effect of a great “ mortality on the number of marriages[1].” In order to shew, most fully, whether the ground to which a retreat seems meditated, in the note, is any more tenable than that which is still continued to be maintained in the text, I shall give the document entire, as far as it regards the marriages, births, and deaths, throughout, and subjoin a few remarks upon the facts it exhibits.

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[1] Malthus, Essay on Population, p. 254.

Ein und zwanzigſte Tabelle.

Liſte vom Königr. Preußen und Herzogth. Litthauen.

Jahre.	Getraute Paare.	Getaufte.	Geſtorbene.
1693	5799	18757	16881
1694	5910	19294	14918
1695	5937	20946	14964
1696	5540	19903	12786
1697	5551	19678	14761
S. 5 J.	28737	98578	74310
Mittelz.	5747	19715	14862
1698	6191	21803	17091
1699	6225	22680	14121
1700	6105	23929	15165
1701	5831	26330	13761
1702	5998	25819	12732
S. 5 J.	30350	120561	72870
Mittelz.	6070	24112	14474
1703	5787	25752	14936
1704	6031	27521	16766
1705	5669	28068	15362
1706	6058	27920	16575
1707	5722	26835	17155
1708	7230	25281	8789
S. 6 J.	36497	161377	98583
Mittelz.	6082	26896	16430

Jahre.	Getraute Paare.	Getaufte.	Geſtorbene.
1709	5477	23977	59196 } Peſt.
1710	„ „	„ „	188537 } Peſt.
			Sum 247733
1711	12028	32522	10131
S. 3 J.	17505	56499	„ „
1712	6267	22970	10445
1713	4930	22032	13432
1714	4544	22794	11888
1715	4571	19606	12000
1716	4530	20609	12155
S. 5 J.	24842	108011	59920
Mittelz.	4965	21603	11948
1717	4743	21443	12301
1718	4278	20994	11047
1719	4345	21880	12656
1720	3945	21996	11789
1721	4313	20668	12406
S. 5 J.	21624	106981	60199
Mittelz.	4324	21396	12039

Jahre.	Getraute Paare.	Getaufte.	Geſtorbene.
1722	4420	20672	11326
1723	4957	21384	10762
1724	4611	21685	13680
1725	4779	21715	14878
1726	4832	21805	13671
S. 5 J.	23599	107261	64317
Mittelz.	4719	21452	12863
1727	4343	19605	11300
1728	4479	17929	12433
1729	4861	22338	13853
1730	5420	21410	13089
1731	4937	21517	13450
S. 5 J.	24040	102799	64125
Mittelz.	4808	20559	12825
1732	5221	21918	16506
1733	5712	20660	15129
1734	5520	25170	13955
1735	5244	23022	16310
S. 4 J.	21697	90770	61900
Mittelz.	5424	22692	15475

Jahre.	Getraute Paare.	Getaufte.	Geſtorbene.
1736	5280	21859	26371
1737	5765	18930	24480
S. 2 J.	11045	40789	50851
1738	5873	20229	15686
1739	6163	23608	15896
1740	4505	21713	15390
1741	5394	21957	15288
1742	5975	22991	14015
S. 5 J.	27910	110498	76275
Mittelz.	5582	22099	15255
1743	5892	25687	13280
1744	5529	26969	12792
1745	5038	25178	15443
1746	5417	23268	18956
S. 4 J.	21876	101102	60471
Mittelz.	5469	25275	15117
1747	5972	26047	15769
1748	6493	27266	15596
1749	6464	28331	17851
1750	6682	29160	18861
1751	6508	30375	18287
S. 5 J.	32119	141179	86364
Mittelz.	6423	28235	17272

Jahre.	Getraute Paare.	Getaufte.	Geſtorbene.
1752	5858	27812	19066
1753	5565	26575	18898
1754	5772	28817	19054
1755	5998	29425	19169
1756	4804	29331	19584
S. 5 J.	27997	141960	95771
Mittelz.	5599	28392	19154

(12) The above is a transcript of the table which Mr. Malthus has selected in proof of his doctrine of "deaths making room for marriages." Excluding, then, the years in dispute, which Susmilch has left out of the averages, and which Mr. Malthus, in the note already quoted, seems conscious ought to be abandoned, though he still retains all the reasoning founded upon them in the text, let us examine the rest of the document in reference to his assertion, that "the other years are sufficient to illustrate the general principle." In the following table the facts are collected which determine the case; namely, the number of the marriages in the most mortal year in each of the thirteen sections; next, those in the most healthful ones; to which two other columns are added, for a purpose further to be explained. The results, thus obtained, cannot possibly be objected to on the ground of partiality in the selection of the particulars from which they are deduced, nor, as it respects this further and final reference of Mr. Malthus, can there be any appeal from them: they are these.

TABLE XXXIII.

EXHIBITING THE MARRIAGES IN THE MOST MORTAL AND THE MOST HEALTHFUL YEAR OF EACH OF THE SECTIONS IN THE FOREGOING TABLE, FROM SUSMILCH.

Mortal Years.	Deaths.	Marriages.	Marriages of the Year after.[1]	Healthful Years.	Deaths.	Marriages.
1693	16,861	5799	5910	1696	12,786	5540
1698	17,091	6191	6225	1702	12,732	5696
1707	17,155	5722	7230	1708	8759	7230
1713	13,432	4930	4544	1712	10,445	6267
1719	12,656	4345	3945	1718	11.047	4278
1725	14,878	4779	4532	1723	10,762	4957
1729	13,553	4861	5420	1727	11,300	4343
1732	16,506	5221	5712	1734	13,955	5520
1736	26,371	5280	5765	1737	24.480	5765
1739	15,896	6163	4505	1742	14.015	5975
1746	18,936	5417	5972	1744	12,792	5529
1750	18,861	6682	6508	1748	15.396	6493
1756	19.384	4804	5399	1753	18,898	5565
	222,120	70,194	72.167		177,397	73,460

(13) Thus is the constantly repeated appeal of Mr. Malthus to this table of Susmilch, in proof of the striking effect which mortalities have on the registers, in making room for marriages, exactly and finally determined. In the most mortal years of each of the thirteen sections, the deaths being, in such years, 222.120, the marriages were 70.149 only; but in the

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[1] The table terminating with the year 1756, the marriages of the year following are taken at the average number of the section.

least mortal years the deaths amounting to 177,597 only, an immense difference, and requiring, according to Mr. Malthus, a corresponding diminution in the marriages, the latter amounted, however, to 73,460; more, by 3266, than in the years when his theory, and this appeal in favour of it, require that there should have been so much smaller a number.

(14) But there is another column given in the preceding extract from Susmilch's table, to which the reader's attention is requested, as answering, by anticipation, the only conceivable objection to this final conclusion. In order to give every possible advantage to Mr. Malthus's argument, the marriages of the years next following the mortal ones are inserted, which affords a latitude in the construction of his terms "very sudden and prodigious," full as ample as the words admit. Now, I am free to confess that on many considerations I should have reconciled the fact to my views of the subject, had I found these subsequent years distinguished by the marriages being somewhat more numerous than those in the healthy ones. The necessities of many whose marriages had been dissolved by the death of one of the parties, in these unusually great mortalities, inducing them to re-enter the marriage state; and the feelings of others, who, after the wound death inflicts on the heart, seek, in due time, solace in the connubial state, as the patriarch Isaac did after the death of his mother; these considerations, I say, rather prepared me to expect an excess of marriages at about such a period after extraordinary mortalities; yet this is not the fact. The reasons advanced in the commencement of this chapter, in proof that increasing and not diminishing numbers conduce to plenty and happiness, and consequently encourage those connexions which are the best evidences of them,

still prevail and more than balance all those other circumstances: still, death does not make room for marriage in the sense attempted to be fixed upon us: witness again this table, to which Mr. Malthus has ventured so often to refer. In the years immediately succeeding the most mortal ones, the marriages, though increased as my argument demands, amount to 72,167 only; falling short, by upwards of a thousand, of the marriages of those years in which, according to the system I am combating, there was the least room for, and ought, therefore, to have been the fewest of them.

(15) This table of Susmilch's may likewise serve as an additional test of some of Mr. Malthus's peculiar notions in regard to the use of registers, which have been previously considered, and which he revives in the chapter under consideration. He says, " On an " average of the 46 years after the plague, the pro- " portion of annual births to annual marriages is as 43 " to 10; that is, according to the principles laid down " in the fourth chapter of this book, out of 43 children " born, 20 of them live to be married. The average " proportion of births to deaths during this period, is " 157 to 100. But to produce such an increase, on " the supposition that only 20 children of 43, or 2 out " of $4\frac{3}{10}$, live to be married, each marriage, I am per- " suaded, for the reasons given in that chapter, must " have yielded eight births[1]."

(16) Mr. Malthus thus not only repeats what he had previously asserted at much length, that the proportion of annual marriages and annual births have absolutely nothing whatever to do with each other, but he here attempts to shew that the marriages and births regularly given, for nearly half a century, have likewise no more relation to each other; these, indeed

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[1] Malthus, Essay on Population, p. 258.

give a proportion of $4\frac{3}{10}$ to 1; but he is persuaded, for reasons given somewhere else, that the real number must in this case have been as 8 to 1. The extravagance of the latter supposition needs not to be pointed out; if the proportion of marriages, in all countries, actually barren, and the still greater number otherwise than prolific, be taken into the account, the usual size of the remaining families will necessarily be so increased as still further to expose an absurdity, which at first sight is sufficiently palpable. But, to dismiss mere conjecture, and to advert to recorded facts: the period in question includes several terms of the average duration of the prolificness of marriages; consequently, most of the marriages which took place during its whole duration, must have already given their whole number of births, which were of course included in the column expressing the annual number of them. Now, supposing the number of children included in this register, though resulting from the marriages which had been celebrated before the commencement of this period, and consequently, not entered in the document, to balance the number of children that would be born after its termination, which were, nevertheless, the product of marriages included in the register; then, as has been before shewn, the whole number of the births divided by that of the marriages, would give the actual and exact average prolificness of each of the latter during that period, instead of having no relation to each other. In this instance the variation is little, and cannot sensibly affect any calculation as to the prolificness of the whole term; and, moreover, that variation, be it noted, is in aid of my proof, the marriages of the five years before its commencement exceeding in number those of the five years at its termination. Appealing, then, to the very same document, and to the same period, I find there were 248,777 marriages; these, according to Mr. Malthus's persuasion, yielded 1,990,216 births; 1,083,872, however, is the actual number. But, even granting him all this, in spite of both facts and possibilities; still his supposition involves his own argument in deeper, and, indeed, inextricable confusion, as is always found to be the case whenever gross liberties are taken with the proportions of Nature. His "important and interesting piece of information," as applied to the table in question, is, that as the proportion of annual births to annual marriages is as $4\frac{3}{10}$ to 1; so it is certain that 2 out of every $4\frac{3}{10}$ births lived to be married in Prussia and Lithuania at this period. Now, supposing then the marriages took place, on the average, at the age of 23 years, or, in other words, that as many married after that period as before, and no more; why, then, as there were, according to the table, 117,066 marriages in the first 23 years after the plague, viz., from the year 1711 to 1733, inclusive, (to avoid all cavil, I take the table as Mr. Malthus represents it, which will not at all affect the illustration,) so, according to his "persuasion," these marriages must have "yielded" 936,528 children. In the next term of 23 years, the marriages resulting from these births, according to the above assumption, having taken place, they ought, according to his rule, (giving, as applied in this case by himself, 2 marriages in $4\frac{3}{10}$ births,) to have amounted to 217,794, or 435,594 persons ought to have lived to marry; but, alas for the theory, the real number of marriages during the whole correlative term, 23 years in advance of the births, that is, from the years 1734 to 1756, inclusive, is 131,711, or, 263,422 individuals, only. According to this method, therefore, of estimating the prolificness of marriages, only 2 out of $7\frac{1}{10}$, instead of 2 out of $4\frac{3}{10}$, would have lived to marry.

(17) But to release Mr. Malthus from his own supposition, that the actual fecundity of marriages could be eight, and the annual proportions only about four births to each, which, from a note in his last edition, though very obscurely expressed, I think he would not be anxious to repeat, a longer consideration having probably convinced him that his attack upon Dr. Price has terminated in any thing rather than a triumph; let us advert, for a moment, to his other equally confident assertion, that, the annual proportion in this table for the period adverted to, being $4\frac{3}{10}$ births to one marriage, two only of the born live to marry. I hardly need repeat that births and the marriages which ultimately result from them are not contemporaneous; and if I again divide the period under consideration into two terms of 23 years each, supposing the average nubile age to be 23 years, (which, as so much has been advanced about the preventive check resuming its operation so soon after the plague, will hardly be objected to as too late,) then it is evident that the marriages of the last division resulting from the births of the former, will express the real proportion of the born who actually lived to marry. Now the births of these first 23 years, namely, those from 1711 to 1733 inclusive, amounting to 500,152; and the marriages 23 years afterwards, namely, from 1734 to 1756 inclusive, to 131,711, or 263,422 individuals, it follows that 2 out of less than $3\frac{8}{10}$, instead of 2 out of $4\frac{3}{10}$ lived to form that connexion. No reference in this case need to be made to the proportion of second marriages, as it equally affects both modes of computation.

(18) In every point of view, therefore, what is

termed so "valuable and interesting a piece of information," for want of possessing which, it is said, Dr. Price, and almost all other writers in political arithmetic, have so "totally misapprehended the principle of population[1]," is, to adopt his own language, when applied to their calculations, "perfectly useless[2]." In fact, according to Mr. Malthus's explanation of the use of registers, casual and desultory observation would be a far surer guide on all matters connected with population than such documents. The disparaging language quoted respecting the laborious and useful pursuits of our best writers on these topics, and the imputation of total ignorance with which they are loaded, will be some apology for any warmth of expression into which I may have likewise fallen.

(19) Such then is the nature of Mr. Malthus's reasoning on this confessedly important branch of the subject—reasoning which he somewhere says will stand though the facts on which it professes to be founded should turn out to be erroneous[3]. I perfectly concur in this idea, singular as it seems; such reasoning in favour of the erroneous principle of population as we are often compelled to advert to, will indeed have a better chance of standing, the fewer and more fallacious are the facts on which it professes to be founded.

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[1] Malthus, Essay on Population, p. 261. [2] Ibid., p. 229. [3] Ibid., p. 296.

CHAPTER XIII.

OF THE EFFECT OF MORTALITIES ON THE NUMBER OF MARRIAGES.

(1) THE purport of this work being not more the subversion of the false and pernicious theory of population now unhappily prevalent, than the establishment of one of a contrary tendency, and founded upon principles of benevolence and truth, I shall persist in the argument of the last chapter, the importance of which to the question at issue is universally recognized; and, first, I shall further investigate authorities to which the author principally referred to has merely alluded, and afterwards appeal in my turn to documents of still greater authority and importance, as well as open to more general examination.

(2) Towards the termination of the chapter already considered, Mr. Malthus thus expresses himself: "For the periodical, though irregular, returns of sickly "seasons, I refer the reader to the valuable tables of "mortality which Susmilch has collected. The "common epidemical years that are interspersed "throughout these tables, will not of course have the "same effects on the marriages and births, as the "great plague in the table for Prussia; but in pro-"portion to their magnitude, their operation will in "general be found to be similar[1]." There being no other method of determining the justness of this appeal to these voluminous tables, than that already pursued in reference to one of them, I have, at obviously no little trouble, adopted it, and I proceed to give the results. In the mortal years distinguished by

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[1] *Malthus*, Essay on Population, p. 265.

Susmilch with an asterisk, the deaths exceed those of the healthy years of the same periods by more than one-third; a prodigious difference, and fully sufficient to produce a great increase in the number of marriages, had such been the order of nature: the marriages were, on the contrary, fewer, instead of more numerous, than those which took place in the healthy years of the same sections, and fewer even than the average number of marriages throughout. But as this point is of the utmost importance in its bearings on the main argument, I have given these tables the greatest attention, and as some of the marks seemed placed in a somewhat arbitrary manner, I have gone through the whole series, taking the most mortal years in each of their several divisions, where the years were consecutive; taking the marriages of those years, and likewise of the year ensuing; next, the healthiest year in each several division, and the marriages of that year; and lastly, the average of the marriages of every such section; and the following are the total results, the particulars of which would have been given, only that their insertion would have spread over far too many pages of this volume.

(3) The number of deaths in the most mortal years, collected from the several sections of the tables in Susmilch's work, as divided by himself, amounts to 3,328,524: the number of the deaths in the most healthy years of the same sections throughout, collected in like manner, is 2,817,262. Now, in the former years, there are in these tables, 889,611 marriages only: in the latter 950,421. But in some of these tables the years are not always given consecutively: rejecting, therefore, all such as not being perhaps satisfactory evidence on the point at issue, and to leave no possible room for undue selection, which partiality for a particular argument may *sometimes, perhaps,* occasion, however unconsciously

and unintentionally; and, to take the numbers, with the most scrupulous exactness, in the mortal years in those registers where the years are given connectedly, so as to make each of the following results attainable, there are, in the several sections, aforesaid, 2,845,336 deaths; in the most healthy, 2,409,761. The latter are, again decidedly, the most favourable to marriage, there having been in those years, 831,423 weddings celebrated, while the average of the marriages in the same periods amounted to 802,782 only. But the question is, were the mortal years more favourable to marriage? So far from that being the case, the number of celebrations in these were 774,098 only (above 57,000 less than those in the most healthful years); and even adding those of the year ensuing, which amounted to 825,381, the number will still be upwards of 3000 short of the average, and more than ten times three thousand below the amount of the weddings of those years in which death had made the least "room" for such connexions. Such is the difference between speaking of documents in support of a theory, and allowing them to speak for themselves in the cause of humanity and truth.

(4) Nor are there any general exceptions in these tables to what I think we are now warranted in calling the law of Nature. Frivolous distinctions are frequently drawn between the comparative operation of the preventive check in towns and country places; I have, therefore, by a little further trouble, discriminated the facts presented, with a view to the obviating of this possible objection. In the provinces of the Prussian monarchy, to which Susmilch seems to have directed his special attention, there were, in the most mortal years, (the results obtained as before explained,) 1,578,113 deaths; the marriages in those years were

463,040, and in the next 474,603, the mean number being, consequently, 468,821; whereas, in the most healthy years, in which there were only 1,274,282 deaths, the marriages amounted to 470,131. In different other countries, whose registers he gives for a series of years, I find the deaths in the most mortal years in the several divisions to amount to 895,269, in which years 232,879 marriages were contracted; in the year ensuing these, 269,247, mean number 251,063; whereas the average number of marriages for the same periods is 261,331; and those years in which the "least room" had been made, were again precisely those in which most had crowded into that state, the deaths being only 846,134, the marriages 276,392. In towns in which we are assured the preventive check is the most operative, (another deduction, by-the-bye, of this reasoning system, which is totally contradicted by facts,) in the years of the greatest mortality, when the deaths amounted to 371,954, the marriages were 78,179; those of the year following 81,531, the mean number 79,855, being 5,044 under the number of the celebrations in the healthiest years, in which 289,021 only had died.

(5) These numbers, if correctly stated, it will be admitted, are quite sufficient to set this controversy at rest; yet, justice to the argument requires that these results should have further consideration, in order to give them their due weight. As, in selecting from every section in the whole tables, where the years are regularly given, that, in the first place, in which the greatest number of deaths occurred, it must be very obvious, that in an increasing population, which seems to have been the case in most of the instances given, supposing that increase to be regular, the largest number would naturally fall in the last year of each division, and

would have, of course, the largest number of marriages opposite; on the contrary, the smallest number of deaths would be expected to stand in the first year of every section, attended by the smallest number of marriages: this difference between the marriages and deaths of the first and last years being regulated by the rate of the increase of the population. Susmilch usually divides his table into averages of five years; and supposing 1¼ per cent. to be the annual rate of increase in any country, the registers of whose population he has given; 5 per cent., it is clear, would be the difference between the number of the marriages and deaths in the first and those in the last year of each lustrum. Now, without meaning that this natural arrangement of the numbers constantly occurs, I contend that there is always a "tendency" to it; such is obvious on the slightest inspection of the tables, and must, indeed, be the fact on the whole, wherever population is advancing. It is clear that some calculations should be made on this principle, if we mean to deal fairly by the proofs brought forward. If, however, they already substantiate the facts at issue, without the considerable addition which is due to this increase throughout, the results must have been still more striking, had the correction been supplied: but they are already decisive.

(6) But on this important, and as it respects the main question, determining point, the facts just presented may be objected to by some, as the only means left of defending a system, which they are as tenacious to maintain as they were eager to embrace. Though I can hardly suppose many will suspect an author of wilfully falsifying printed documents, still, I should have been glad to have presented at full length the tables thus examined; but as it would

have involved the printing of some hundred additional pages of figures to have done so, I was obliged to decline it. All I can therefore do, is to offer the documents from which the preceding sums are obtained to the examination of any who may be disposed to controvert their exactness; or, rather, to refer such to the original tables themselves. In the mean time, I can assure the reader, that I had an inducement to be as exact as possible, even beyond what the determination of the subject in dispute supplied. I had, as I believed, previously discovered, from the examination of other records, a law of nature, far more mysterious, and not less certain than the one just examined, and this I found fully confirmed by these very registers, as well as by all others to which I have hitherto had access. A law, were the principle of population I am opposing true, which necessarily presents Providence in the perpetual act of malignantly frustrating the very attempts which Nature makes to mitigate the evils which that principle inflicts: but, if the system developed in this work is that of truth, which exhibits the same gracious power as the unwearied instrument, not only of promoting the general prosperity of mankind, but of instantly repairing those incidental calamities to which they are exposed. More of this, however, hereafter, when I shall, like Muret, "betake myself to a miracle[1];" that is, venture to attribute the undoubted operations of Nature to a principle of intelligent and active benevolence.

(7) But to return. The reader may, perhaps, after all, refuse his confidence to my deductions from tables thus mutually appealed to by us both; but not easily to be met with, at least in this country, especially after having seen the incorrect use that has been made of

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[1] Malthus, Essay on Population, p. 272.

them: though I cannot but think that mine are of a very different character from those founded upon mere vague and general references, still, on a subject of so much moment, every reasonable objection ought to be considered; and this shall be entirely removed by transferring the proof to the registers of those other countries, which are generally referred to throughout the entire argument; the statistics of which are published here, and are sufficiently familiar to all who attend to inquiries like the present.

(8) Respecting Sweden (including Finland), Wargentin has given the marriages of fifteen successive years, from 1749 to 1763 inclusive[1]; dividing this period, after the manner of Susmilch, into three sections of five years each, these are the results.

TABLE XXXIV.

SHEWING THE EFFECT OF MORTALITIES ON THE NUMBER OF MARRIAGES IN SWEDEN.

Mortal Years.	Deaths.	Marriages.	Marriages of the Year after.	Healthful Years.	Deaths.	Marriages.
1749	61,171	19,045	20,927	1753	55,407	20,089
1758	74,487	19,484	23,210	1754	64,341	21,994
1763	85,093	20,927	22,282*	1760	60,323	23,383
Totals.	220,751	59,456	66,419	..	180,071	65,466

This table also is conclusive as it regards Sweden. In the mortal years, the deaths exceeded those in the healthful ones by above 22 in the 100; but the marriages in the latter exceeded those in the former by

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[1] Wargentin, Kongl. Vetens. Academ. Handl. 1766, Q. In Sir Joseph Banks's Library.

* This sum is the average of the last five years, the year after 1763 not being given, the table terminating with that year.

6010; and even if the years after the mortal ones be added, still their mean number falls short by 2529.

(9) The census of France, as given by the Bureau of Longitude, for the years 1817 to 1824 inclusive, presents a less remarkable variation in the number of annual deaths than any of the documents hitherto referred to. Still it establishes the fact for which I contend; though, as it ought to do, admitting the deduction I have made to be a law of Nature, by a difference less striking. This term must of course be divided into four years only, as, indeed, some few of Susmilch's are. The facts in point are then as follow[1]:

TABLE XXXV.

SHEWING THE EFFECT OF MORTALITIES ON THE NUMBER OF MARRIAGES IN FRANCE.

Mortal Years.	Deaths.	Marriages.	Marriages of the Year after.	Healthful Years.	Deaths.	Marriages.
1819	788,055	215,088	208,893	1817	748,223	205,244
1822	774,162	247,495	262,020	1823	742,735	262,020
Totals.	1,562,217	462,583	470,913	..	1,490,958	467,264

France, therefore, may be confidently appealed to in contradiction of the notion that deaths make room for marriages. The marriages in the most fatal years are fewer than in those the least fatal; and, even if the year following be added to the former, the mean number is again less than that which appears in the years of the least mortality.

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[1] Since writing this, I have seen the annual report for 1825, and this gives 798,012 for the deaths of that year, the largest number that has yet occurred; but the marriages are only 243,674—fewer by 18,346, than those which took place in the least mortal year of the nine now given. See the Annuaries.

(10) But the last national test to which I shall submit this dispute will be far the most satisfactory and interesting to the reader; comprehending, as it does, a much longer term of years than any of the recent documents referred to; and especially as it relates to England, whose statistics are in every one's hands: a country containing a more dense population than perhaps any other country of equal extent in any part of the world, and where the principle I am combating, if it operate at all, must operate with great exactness. Such, indeed, is asserted to be the case; and so precise are Mr. Malthus's ideas upon the subject, and so nice his calculations as to the effect of "room and vacancies," about which he is perpetually speaking, especially in reference to this country, that he pronounces that the "portioning of twenty maidens "with a hundred pounds each," so as to cause their marriage, would be "balanced by the necessity of celibacy in twenty other maidens somewhere else," or else by "an increase in general difficulties of rearing "children and getting employment[1]." His ideas on the subject are expressed with sufficient precision: the only question is, are they true? Thank God, they are otherwise! I proceed, then, to the determination of the subject, as referrible, lastly, to England. Does a superproportion of deaths make room for an increase in the number of marriages? Certain as to the determination of this point, and, here at least, conscious of being exposed to examination and detection throughout, I shall give to it the most scrupulous attention. The annual marriages and deaths have been given during the term of forty-one years, namely, from 1780 to 1820

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[1] Malthus, Essay on Population, p. 550.

inclusive; a period sufficiently extended to be decisive of the dispute as it regards this country: and, being quite aware that particular classifications of facts are often very adroitly made, so as to answer special purposes, I shall vary the classification or divisions of this period, so as to render any practices of that nature impossible. The following table, then, will exhibit the totals as collected from the registers of England, the particulars of which will be found in the published censuses, and obtained in the following different methods: The first line gives the total of the deaths in the most mortal years, and the marriages of those years and of the next succeeding ones, contrasted with the alternate or most healthful years, and the marriages therein; forty years of the register being in this instance divided into twenty sections of two years each, commencing with the year 1780, and terminating with that of 1819. The second presents the same facts, the table being similarly divided, only that it is made to commence at 1781, and to terminate at 1820. In these two biennial divisions, therefore, every year is introduced, and each differently arranged. The third, fourth, and fifth lines give the same period, divided into thirteen sections of three years each; the first from 1780 to 1818, the second from 1781 to 1819, and the third from 1782 to 1820: these three ternaries, consequently, include all the years, though each is again differently connected. In the sixth and seventh lines, the sections are of four years each, respectively commencing at 1780 and 1781, and terminating at 1819 and 1820. In the eighth and ninth, the divisions are each five years (eight in number), commencing and terminating as the preceding ones. A column is also added, expressing the average marriages of each class of sectional divisions throughout. The results thus obtained are, therefore, placed beyond the imputation of being produced by partial arrangement, or selection; and if they concur with those previously adduced, and with each other, are as far removed from the possibility of being the effects of chance. The registers of England and Wales, that part of the Empire respecting which alone they are published, and for the whole period since they are annually given, thus decide the question:

TABLE

SHEWING THE EFFECT OF MORTALITIES

Period.	Number of Sections.	Years in each.	Deaths in the most Mortal Years.	Marriages in the most Mortal Years.	Marriages in the next ensuing Years.
1780 to 1819	20	2	3,949,618[a]	1,559,470	.. ..
1781 1820	20	2	3,988,117[c]	1,570,711	.. ..
			7,937,735	3,130,181	.. ..
1780 1818	13	3	2,605,936[e]	987,719	1,032,656
1781 1819	13	3	2,593,930[f]	1,021,762	1,031,758
1782 1820	13	3	2,625,887[g]	1,035,709	1,042,091
			7,825,753	3,045,190	3,106,505
1780 1819	10	4	2,014,117[h]	770,939	789,973
1781 1820	10	4	2,028,484[i]	768,455	800,947
			4,042,601	1,539,194	1,590,920
1780 1819	8	5	1,634,840[k]	606,923	610,221
1781 1820	8	5	1,634,547[l]	609,771	646,402
			3,269,387	1,216,694	1,256,623
Totals of the last seven divisions.			15,137,741	5,801,078	5,954,048
Mean annual sum of ditto.			201,836	77,347	79,387

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[a] Dividing the registers thus, these years are, 1780, 1783, 1784, 1786, 1788, 1791, 1793, 1795, 1797, 1799, 1800, 1803, 1805, 1807, 1808, 1810, 1812, 1814, 1816, 1818.

[b] The years omitted in the preceding enumeration.

[c] The years, 1781, 1784, 1785, 1788, 1789, 1792, 1793, 1795, 1797, 1800, 1801, 1803, 1806, 1808, 1810, 1812, 1814, 1816, 1818, 1820.

[d] The remaining years.

[e] The years, 1780, 1784, 1788, 1791, 1793, 1796, 1900, 1801, 1806, 1808, 1810, 1814, 1818.

[f] The years, 1782, 1783, 1787, 1790, 1792, 1796, 1798, 1802, 1804, 1809, 1811, 1813, 1817.

[g] The years, 1781, 1784, 1788, 1790, 1792, 1795, 1797, 1800, 1803, 1807, 1810, 1812, 1814, 1818.

[h] The years, 1782, 1786, 1787, 1790, 1794, 1798, 1799, 1804, 1806, 1809, 1813, 1815, 1817.

[i] The years, 1784, 1786, 1788, 1793, 1796, 1797, 1800, 1803, 1808, 1810, 1814, 1816, 1818.

XXXVI.

ON THE NUMBER OF MARRIAGES IN ENGLAND.

Mean number of the two last Columns.	Average Number of Marriages in each Section.	Deaths in the most Healthful Years.	Marriages in the most Healthful Years.
.. .. ..	1,568,216	3,841,023[b]	1,576,963
.. .. ..	1,584,479	3,812,525[d]	1,598,246
.. .. ..	3,152,695	7,653,548	3,175,209
1,010,187	1,013,621	2,459,351[f]	1,021,943
1,026,760	1,024,041	2,454,058[h]	1,028,721
1,038,900	1,035,063	2,467,324[k]	1,059,255
3,075,847	3,072,725	7,380,733	3,109,919
780,456	784,108	1,888,719[m]	799,180
784,701	792,230	1,872,061[o]	786,558
1,565,157	1,576,338	3,760,780	1,585,738
608,572	627,287	1,490,760[q]	638,772
628,029	633,791	1,496,613[s]	630,172
1,236,601	1,261,078	2,987,373	1,268,944
5,877,605	5,910,141	14,128,886	5,964,601
78,367	78,802	188,385	79,528

[k] The years, 1782, 1787, 1790, 1791, 1796, 1798, 1802, 1804, 1806, 1811, 1813, 1815, 1820.

[l] The years, 1780, 1784, 1788, 1795, 1797, 1800, 1807, 1810, 1814, 1818.

[m] The years, 1782, 1787, 1790, 1792, 1798, 1802, 1804, 1811, 1813, 1817.

[n] The years, 1781, 1785, 1792, 1795, 1800, 1801, 1808, 1810, 1814, 1818.

[o] The years, 1782, 1787, 1790, 1796, 1798, 1804, 1805, 1811, 1813, 1817.

[p] The years, 1780, 1785, 1793, 1795, 1800, 1808, 1810, 1818.

[q] The years, 1782, 1787, 1790, 1798, 1804, 1805, 1813, 1815.

[r] The years, 1781, 1788, 1795, 1800, 1801, 1810, 1814, 1818.

[s] The years, 1782, 1787, 1791, 1798, 1804, 1806, 1813, 1817.

(11) The above documents speak to the plainest understanding, and peremptorily and for ever determine the important question before us, at least so long as the laws of Nature and the elements of society shall remain unchanged. They decide, on the suffrages of millions of facts, regularly occurring through the period of more than forty years, not partially selected, but taken universally, and placed in every form of combination which the nature of the subject admits, that the doctrine of the anti-populationists, which it has been the purport of this chapter to disprove, is not only not true, but that directly the contrary to it is the real fact; that an excess of deaths does not make room for an immediate, or even consequent increase of marriages, but the reverse: thus, whether the term in question be divided into two years, or into three, or four, or five, years, or these divisions are again varied by altering the date with which each commences, still the facts throughout are the same. In the year in which the greatest number of deaths occurs, the marriages are fewer than those in the next years, and even the mean number of these two years is below the average number of weddings at the same periods, and always still further beneath those occurring in the most healthful years, which is the great test of the question at issue. The certainty and regularity with which these results present themselves is most striking, but I shall merely refer to the table, without particularizing them.

(12) But these facts speak to the heart yet louder than to the understanding. Not only do they demolish the theory which they were invoked to support; a theory which represents all the avocations of life preoccupied and full, and that human beings, already too numerous, stand in the way of each other's happiness, so that even the marriage of an extra twenty poor

maidens here, would inevitably cause the necessary celibacy of twenty others there[1], and, consequently, that mortality is above all things the regulator of marriages; quenching, therefore, the dearest feelings, and paralyzing the most benevolent efforts of mankind: I say, not only do they demolish this theory, and shew the stronghold of selfishness and cruelty to be "a refuge of lies," but they lay the solid foundation of a more cheering system upon unerring facts; they prove that man, while obeying his purest feelings, is pursuing his truest interest, and co-operating with his species in furtherance of the general good, which is still augmented and secured by his increasing numbers. The torch of Hymen, therefore, is not lit at the sepulchral lamp, but at the altar of that sacred system where domestic rises into social, and social into public happiness, while the spirit of philanthropy and benevolence pervades and animates the whole, rendering it at once the asylum of the purest affections and the sanctuary of God.

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[1] Malthus, Essay on Population, p. 550.

CHAPTER XIV.

OF THE EFFECT OF SCARCITIES ON HUMAN PROLIFICNESS.

(1) A LATE writer, who has attempted to demonstrate that the duplications of the population of the United States, as asserted by Mr. Malthus and others, are consistent with the principles of natural increase, and independent of emigration, has furthermore lent his sanction and assistance to the theory of human superfecundity, now attributed to the latter author, namely, that "mankind breed up to the level of food," professing to demonstrate the fact by actual calculation. His proof will therefore constitute one of those numerical errors into which writers of this class have fallen on the subject of population, which it is the purpose of this book to rectify. But in order not to misrepresent his meaning, I shall give the whole of what he has advanced upon the subject, at least in reference to this country, to which he primarily and particularly alludes.

(2) Mr. Milne is the author to whom I allude. In that section of his valuable work on Annuities, in which he treats upon the progress of population, he thus expresses himself; "It will be observed, that any mate-
" rial reduction in the price of wheat, is almost always
" accompanied by an increase both of the marriages
" and conceptions, and by a decrease in the number of
" burials; consequently, by an increase in the excess
" of the births above the deaths.

" Also, that any material rise in the price, is gene-
" rally attended by a corresponding decrease in the
" marriages and conceptions, and by an increase in the

" burials, therefore, by a decrease in the excess of the " births above the deaths.

" Thus, it appears that an increase in the quantity " of food, or in the facility wherewith the labouring " classes can obtain it, accelerates the progress of " population, both by augmenting the actual fecundity, " and diminishing the rate of mortality; and that a " scarcity of food retards the increase of the people, " by producing, in both ways, opposite effects.

" This table" (alluding to one subjoined) " shews " that an increase of food increases the actual fecundity, not only by promoting new marriages, but by " rendering those already contracted more prolific: " thus—

There were in the Year	Marriages.	Conceptions.	When the price of the Quarter of Wheat was
1790	70,648	255,508	£2 13 2
1792	74,919	264,028	£2 2 11
Differences	4,271	8,520	£0 10 3

" Whereby it appears, that a fall of 10*s*. 3*d*. in the " price of the quarter of wheat was attended by an increase of 4271 in the number of the annual marriages, " while the annual conceptions were augmented by " nearly twice that number. Again,—

There were in the Year	Marriages.	Conceptions.	When the price of the Quarter of Wheat was
1795	68,839	256,781	£3 14 2
1797	74,997	270,535	£2 13 1
Differences	6,158	13,754	£1 1 1

" When the increase of the conceptions accompanying " the fall of wheat, was more than double that of the " marriages.

" But the mass of the population seems not to have " recovered so quickly from the effects of the great " dearth of 1800 and 1801, for, although wheat was " 50*s*. a quarter lower in 1802 than in 1801, and this " fall was accompanied by an increase of 23,000 in " the annual marriages, the conceptions only rose to " 21,000; and a further fall of 11*s*. in the price the " year following, was attended by an augmentation of " 4000 in the marriages, and only 400 in the concep" tions; after this, however, these last resumed their " usual course.

" The relation between the *decrements* in the annual " marriages and conceptions that accompany the *rise* " of wheat, are generally similar to these; but in the " conceptions not quite so regular: perhaps, for this " reason, that rising prices may deter from marriage, " without the scarcity being so great as to render " those already married less prolific[1]."

(3) I might, were it necessary, controvert the method here pursued, in order to ascertain the comparative prolificness of different years, and dispute the fact, that in this country, the prosperity of which depends so much on its agriculture, and where the national charity protects all from actual want, high prices for the products of internal industry involve a greater mass of the community in distress than low ones: I might also remark, that Mr. Milne has totally left out of his calculation the great fluctuation in the relative value of that medium by which he determines the question of comparative plenty or scarcity; and, above all, totally omitted to notice the

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[1] Milne, Treatise on Annuities, vol. ii., pp. 390, 391, 392.

effect which a change from peace to war, and contrariwise, has, for very obvious reasons, on the prolificness of standing marriages; which changes repeatedly occurred during the period his table embraces. The question, therefore, seems rather too complicated to be thus summarily disposed of. Previously, however, to examining the subject by other, and, as I think, more correct methods, I shall shew, that even his own mode of computation will lead us to a very opposite conclusion to that at which he has arrived.

(4) First, however, I must remark, that I do not deny but that dear seasons have, not unfrequently, the effect of postponing, in some instances, marriages, and, consequently, of lessening the number which take place in such years. Nor is it my purpose, at present, to contend that dear years may not be rather more mortal than plentiful ones; though, when this is the case, it is more probably occasioned by the inferior quality of the food, than from its insufficiency in quantity, a circumstance which affects the higher as well as the lower ranks of society, and the former, we are assured, far more seriously, in proportion to their numbers[1]. This point, however, has been controverted by medical writers; nor does it appear very evident, by the table referred to, that any material reduction in the price of wheat increases the excess of the births above the deaths: for, adverting to the last seven years it contains, a diminution in the price of wheat in the year 1806, of 8*s*. 10*d*. the quarter, as compared with the preceding one, was attended with a diminution in that excess, to the amount of upwards of 2000, whereas an increase in that price in the year 1809, as compared with 1808, of 16*s*. 7*d*. per quarter, was

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[1] See Drs. Baker and Cheyne, History of the Fever in Ireland, passim.

coincident with an increase in the same excess of above 13,000. Other parts of the table alternately give contrary conclusions in this respect; but, I repeat, it is not this position I mean to controvert, but the assertion, that an increase in the quantity of food, and in the facility of obtaining it, or, in other terms, an increased degree of ease and affluence, augment the actual fecundity of human beings; a doctrine which is in direct opposition to the general principle of this treatise, and especially to the physiological argument hereafter to be adduced. I shall, therefore, examine the truth of this notion, and first by the method he has indicated.

(5) To take, then, a proof to the contrary, from the very year succeeding that with which Mr. Milne's first instance terminates, arranging it in precise conformity to his own mode.

There were in the Year	Marriages.	Conceptions.	When the price of the Quarter of Wheat was
1793	72,880	256,811	£2 8 11
1795	68,839	256,781	£3 14 2
Differences	− 4,041	− 30	+£1 5 3

Whereby it appears, that notwithstanding a diminution in the number of marriages, to the amount of upwards of four thousand, still the conceptions were almost exactly coincident, although wheat had advanced in price above one half!

(6) I took the preceding example, in the first instance, merely because it happened to be the next in the order of time to that of Mr. Milne's; but, on consideration, it is undoubtedly one of the most decisive

that could have been selected. The last year referred to was one of peculiar severity; the great advance in the price of the prime necessaries of life pressed far more heavily on the lower ranks, than the mere nominal sums intimate; for the wages of labour had not then, generally speaking, been adjusted to the great and sudden change. I refer for an affecting account of that year, to Mr. Ruggles, who, in his valuable history of the poor, describes the distresses to which that class was then subjected, and the consequences to which they led. Striking, however, as is the fact the preceding document exhibits, it nevertheless does not express the truth, as it respects the question before us, to its full extent. This was the third successive year in which the marriages had regularly declined in number, consequently the diminution in the latter year does not adequately exhibit the deficiency in the number of marriages; and when it is recollected that the first years of matrimony are far the most fruitful in conceptions, this annual decline ought also to be taken into account. But without taking into consideration one of these circumstances, the single fact apparent on the face of the table is sufficient to determine whether the price of wheat rules the powers of generation in the manner supposed by our author. The case is of so extreme a character, that it would have called into actual operation, and manifested such a law of Nature had it been in existence, not by "tendencies" towards a certain result, but by striking and corresponding effects. Here is an advance of wheat, of more than one half; a great diminution in the number of marriages; and yet, the rest, it is evident, "bring forth more abundantly," so as to make up for all the deficiencies, not only of the year in question, but even of the two preceding ones likewise.

(7) I take another instance, only two years in advance of the last given by Mr. Milne; and one included in his own table.

There were in the Year	Marriages.	Conceptions.	When the price of the Quarter of Wheat was
1799	77,557	254,870	£3 7 6
1801	67,228	273,837	£5 18 3
Differences	– 10,329	+18,967	+£2 10 9

What shall be said of this instance, certainly the most important to the question, in all respects, that the entire period affords? All the circumstances connected with it are most striking and decisive. There was an universal war, which employed all the energies, and personally engaged much of the youthful population of the country; and the effect of war in diminishing the fecundity of vast numbers of subsisting marriages needs not be again alluded to. In the first year of these two, corn, considering the alterations in the currency and the wages of the country, was at a moderate price; in the last it rose to the appalling one of one hundred and eighteen shillings the quarter, and, moreover, it was the second and severest year of the great dearth, as Mr. Milne calls it, who, arguing upon the law of population on mechanical principles, holds, as we have seen, that the effect of a scarcity does not subside with the cause; so that the year 1801, following that in which corn was also one hundred and thirteen shillings the quarter, ought to have been doubly unprolific. Now, what are the facts? Corn rose 75 per cent. as calculated on the first year: the annual marriages fell in amount 10,329; and became lower in number than they have been since the year 1783; nor let me omit to state, what is quite as essential to the proper understanding of the subject, that the marriages of the intervening year had likewise fallen in number 7706; and, even in the first year, 1799, there were fewer weddings celebrated than in the one immediately preceding, by nearly 2000: so that, instead of an increase in proportion to that of the population, there was a deficiency as calculated on the year 1798, (by no means an extraordinary year,) amounting on these three years to 23,795 new married couples, and yet, notwithstanding all this, the year 1801, the most dreadful one, in all probability, England has ever experienced in late times, when war, pestilence, and all but famine, were at once scourging the nation; I say, in this year there were more conceptions than had ever occurred in any one year since England had a name amongst the nations of the earth! But, to confine myself to this one year, there were, I repeat, 10,329 fewer marriages, corn being nearly double in price, and still there was an excess of 18,967 conceptions: facts which confirm the physical views I take of the principle of population; and, if the moral and political ones I entertain of its consequences are correct, namely, that it pleases the Author of our being to increase the happiness of that existence which he confers, while he multiplies the number of its participants, and by means of that multiplication; then, so vast and sudden an augmentation in human prolificness, under circumstances so afflicting, rises into a sacred proof of the divinity of the principle for which I contend, and we may well exclaim, while viewing the effect resulting from them, in the language of Shakspeare, though on a very different occasion, "O God, thine arm was here!"

(8) To give a proof or two of the same principle, in converse operation; and, first, one which I think

Mr. Milne ought to have noticed, as it exhibits the very contrast of price he sought, and in a much stronger manner than either of the instances he has selected, and which occurs in the succeeding years to one of them.

There were in the Years	Marriages.	Conceptions.	When the price of the Quarter of Wheat was
1796	73,107	268,088	£3 17 1
1798	79,477	266,769	£2 10 3
Differences	+ 6,370	— 1,139	~~+~~— £1 6 10

Here, then, the price of wheat has fallen much more than in Mr. Milne's most material instance; the former year being 50 per cent. dearer than the latter; there were, nevertheless, 6370 more marriages, and still 1319 fewer conceptions in the cheap, compared with the dear, year; and it must be again remarked, that the increased marriages of the intermediate one also still strengthen the conclusion.

(9) Perhaps it will be expected that the years exhibiting the most important declension in the price of provisions, which have occurred since the commencement of the table to the present time, should be examined. The facts relative to these are as follows.

There were in the Years	Marriages.	Conceptions.	The price of Wheat being per Quarter
1801	67,228	273,837	£5 18 3
1803	94,379	294,592	£2 16 6
Differences	+27,151	+ 20,755	—£3 1 9

The striking facts this table exhibits hardly need to be pointed out. Corn was, in reference to the means of purchasing it, as well as to its nominal value, in the extremes of price; and had become, in regard to the state of the circulating medium and the wages of labour, as decidedly cheap in the last year, as it was enormously dear in the former one. The marriages in 1803 exceeded those of 1801 by 27,151; the births, by 20,755 only; being in the proportion of far less than one birth to each marriage, instead of about twice that number, which Mr. Milne, I hardly know upon what data, takes as manifesting an unusual degree of fecundity. The difference between the first and third year, then, is, in the price of wheat, above 100 per cent., in marriages, above 40 per cent., but, in conceptions, only about 7 per cent.! This is quite sufficient to decide the bearing of this instance, but the half is not yet told; in the intervening year there had been 90,396 weddings celebrated, so that in that and the succeeding year the excess of marriages over those of 1801 was to the enormous extent of 117,547, or, to speak more fairly, the mean difference was 50,319. Singular, indeed, would it be upon Mr. Milne's hypothesis, which invests the existing marriages with such additional fertility at any considerable lowering in the corn markets, if these, with above fifty thousand supernumerary recruits should, in the second year, give only 20,755 extra conceptions, compared with those of the former year. But even these circumstances, important as they are to the question, are as nothing compared with the influence of that momentous event which occurred in the intermediate year, namely, the return of peace, which would doubtless have the effect of restoring to each other scores of thousands of married couples, nearly all of whom, it may be safely inferred, from the very nature of the service in which the husbands had been engaged, were in the prolific season of life. Should any one doubt as to the importance of this consideration, I would refer him to the effect which the former peace, of 1784, and the subsequent one, of 1814, had upon the conceptions of those years, and I think he will be satisfied on this head. All these facts, therefore, being taken into the computation, as they evidently ought to be, it is clear that the last instance forms as irresistible a refutation of Mr. Milne's theory as any of the preceding ones, where the mere numerical demonstration may seem somewhat more conclusive.

(10) Such are the proofs, as it respects the past, of the existence of a law of Nature, plainly resolvable into the most beneficent purpose; and one which, we may therefore rest assured, does and will still continue to operate. Thus, in the very year in which Mr. Milne was publishing his otherwise most valuable work, was time preparing to refute his arguments upon this question. For instance:—

There were in the Year	Marriages.	Conceptions.	When the Price of the Quarter of Wheat was
1815	99,944	330,199	£3 1 10
1817	88,234	331,384	£4 10 7
Differences	—11,710	+ 1,185	+ £1 8 9

Here, again, we have an advance in the price of food which ought to have checked most severely the national prolificness, had there been the least foundation for the principle I am controverting. There were, in the dear year, 11,710 fewer marriages, and, nevertheless, 1185 more conceptions: and, as in every other case I have brought forward, the marriages of the intermediate year strengthen the argument, being fewer in number than the first one, by 7998, when the price of wheat was 25*s.* 6*d.* per quarter higher, and still the conceptions were 1384 in excess.

(11) I shall refrain from many further observations on Mr. Milne's theory of population, or the method by which he attempts to prove it: I cannot, however, avoid remarking the singular incoherence into which so able a writer falls, when reasoning upon this subject; the fate of all, as it appears to me, who take up a system so untenable and revolting. Although he admits that rising prices may deter from marriage, without at the same time rendering those already married less prolific, still he contends that the great dearth affected the prolificness of the married during two succeeding years, though the marriages of those years, as it appears by the very document he was consulting, enormously increased. But, that those years were actually affected by the dearth, so as to be rendered comparatively unprolific, I deny; I assert the reverse. As, however, the effect of an affluence in food, and its concomitants, comparative ease and luxury, on human increase, forms an essential feature of the principle at issue, and constitutes the very foundation of a subsequent part of the argument, I shall take leave of this controversy in order to pursue the inquiry, by other, and, I think, more certain methods of examination.

CHAPTER XV.

OF THE EFFECT OF SCARCITIES ON HUMAN PROLIFICNESS.

(1) I PROCEED to consider, more particularly, the effect of variations in the price of food upon the principle of human prolificness; a subject which, the more accurately it is examined, the clearer will it prove, not only that the views held by the anti-populationists are erroneous, but that directly contrary ones are true; and a powerful physical argument will arise in support of the law of population, as propounded in this treatise. The present chapter, therefore, might, perhaps, have been more properly added to those in a subsequent book, in which that law is founded upon physiological principles. The arrangement of the various parts of this work, so as to avoid tautology, and still keep those arguments as much as possible together which have a mutual bearing upon each other, has been a matter of considerable difficulty; especially, as in the present instance, where the detection of a numerical error in the supposed demonstrations of those whose theories I am opposing, terminates in a direct proof of the truth of that which I maintain. I cannot, however, but regard the mutual relation of different branches of the argument to each other, and the general harmony of the whole, as affording a gratifying proof of the consistency and truth of the system.

(2) The question is, what kind of effect variations in the price of food, which may be said to be indicated by that of wheat, have upon the prolificness of the existing marriages. The inquiry will be first and

principally confined to this country, which alone affords the necessary facts for a sufficient number of years past, by which to determine it.

(3) The official censuses of England and Wales present us with the number of the marriages annually contracted only, and not of those previously subsisting; and as it is obvious, that these are in no necessary or known proportion to each other, and as the number of the latter can alone decide the question, it has to be determined by calculation, which, if founded upon different data, mutually confirming and correcting each other, the results may be regarded as being equally satisfactory for the purpose of comparison, on which the argument solely rests, as though the computation were critically exact; especially since, by this uniform method, it is impossible to be betrayed into those false accommodations of facts, or partial selection of them, which, in enquiries of this nature, are often made to serve an argument at the expense of truth.

(4) In making these computations, there is another most important circumstance to be attended to, which, as far as I have observed, has escaped the attention of all writers who have calculated the prolificness of marriages, upon the facts which are given by registers; I mean, the far higher degree of fecundity (as shewn by the conceptions) in the first year of marriage, than in any of the succeeding ones to its termination: on any general calculation, certainly more than a fourfold proportion, when so compared; and calculated on the fruitful years of marriage, at least a double one, on the average. The number of the annual marriages, being exceedingly various, it is quite clear that the number of the conceptions of that year will vary proportionably; and it is equally plain that the differences so occasioned do not at all deter-

mine the question, as to the comparative prolificness of the entire number of existing marriages. It has been from the want of attending to this essential consideration, that the error, which I am now refuting, as well as many similar ones, has been fallen into. In again referring to a register of the peerage which I have formed, with a view to the determination of this and many other interesting questions, I find that two-thirds (very exactly) of the marriages produce a birth each before the termination of the year following that in which they take place; and that each of the ensuing fecund years are, on the whole, only about half as prolific; but if calculated on the entire duration of marriages, the remaining years are, on an average, each less than a quarter as productive. Now, I think none would carry the argument so far as to assert, that the price of grain influences the fertility of the first year of marriage. I shall, therefore, in the ensuing calculations, deduct, or rather leave out, the marriages of the current year from the whole number; and subtract, from the conceptions of that year, a number equal to two-thirds of such marriages: the remainder will then express, accurately enough, the regular prolificness of the rest of the standing marriages, freed from the fluctuations which arise from variations in the number of the annual weddings. The variations in the annual prolificness of these standing marriages, collated with contemporaneous differences in the price of food, or wheat, will thus determine the question.

(5) The number of the annual marriages and deaths, during the period about to be examined, being known, to find the sum of the standing marriages at the commencement of it, and the proportion of existing marriages dissolved by the annual deaths, is the question. The number of standing marriages assumed

as those existing in 1780, was the result of a series of calculations, founded on the population, and the proportion they bear to it in other countries, and in some districts of this, where that proportion has been actually ascertained: taking into consideration, also, the various circumstances which might affect it, namely, the average age of marriage, the degree of its prevalence, and the expectation of life. From the amount of the standing marriages thus obtained, I deducted 1 in 3.11 of the annual deaths, as being the proportion of them which would be yearly dissolved by death. There was no difficulty as to the annual accessions to the existing marriages, these having been published.

(6) Without presuming that the results thus obtained are exact, I conceive they are sufficiently so to decide the question; which, as before observed, is one founded on comparison only. I do not, however, think that they are very remote from the truth: the various proportions they exhibit support each other; and, indeed, as a final proof that they are tolerably accurate, it will be found, that if the average annual fecundity of each marriage, as expressed in the ensuing table, be multiplied by its average duration, and two-thirds of a birth, or .666 be added to it, the sum will be very nearly that of the average prolificness of marriages, as given in the public documents for the same period. I assume, then, as the result of calculations formed, as explained above, that the existing marriages of 1780 amounted to 1,289,550, whereof 61,760 were weddings of that year, the conceptions belonging to which were 41,140, leaving 182,983, as resulting from 1,227,790, the couples married previously to 1780; the annual prolificness of each, therefore, was in that year, $\frac{149}{1000}$ of a birth each. The ensuing table then proceeds thus:—

TABLE

Shewing from the Registers of England, the effect

Years.	Annual Marriages.	Annual Conceptions.	Annual Deaths.	Annual Births to each 100 Marriages.	Conceptions from the Year's Marriages.
1780	61,760	224,123	191,736	363	41,140
1781	61,146	218,022	189,172	356	40,764
1782	61,834	214,579	180,914	347	41,223
1783	64,898	222,709	181,989	342	43,325
1784	67,583	237,229	187,921	351	45,055
1785	70,146	235,323	185,470	335	46,764
1786	67,639	237,653	179,058	351	45,093
1787	69,067	243,085	178,718	352	46,044
1788	67.559	243,001	181,345	359	45,039
1789	69.310	248,774	179,384	359	46,540
1790	69,263	247,765	178.731	338	48,845
1791	71,167	261,262	180,452	368	47,445
1792	74,450	256,027	182,609	344	49,633
1793	71,451	249,029	196,865	348	47,634
1794	70,390	247,218	191,149	351	46,927
1795	67,489	248,000	203,328	367	44,933
1796	71,674	259,964	184,534	362	47,783
1797	73,526	262,337	184,929	356	49,017
1798	77,919	258,685	181,313	332	51,946
1799	76,036	247,147	183,267	325	50,690
1800	68,481	237,029	201,128	346	45,654
1801	67,228	273,837	204,434	407	44,452
1802	90,396	294,108	199,889	314	60,264
1803	94,376	294.592	203,728	312	62.917
1804	85,738	292,210	181,177	341	57,158
1805	79.686	291,929	181,240	366	53.057
1806	80,754	300,294	183,452	371	53,836
1807	83,923	296,074	195,857	352	55,948
1808	82,240	299,989	200,763	364	54.827
1809	83,369	298.853	191,471	358	55,549
1810	84,470	304,857	208,184	361	56.313
1811	86,389	301,954	188,543	349	57,593
1812	82,066	314,432	190,402	383	54,711
1813	83,860	318,806	186,477	380	55,907
1814	92,804	344,931	206,403	371	61,869
1815	99,944	330,199	197,408	330	66,629
1816	91,946	331,584	205,959	360	61,294
1817	88,234	331,384	199,629	378	58,823
1818	92,779	333,261	213,624	359	61,853
1819	95,571	343,660	213,564	359	63,714

XXXVII.

Of Scarcities on the Prolificness of Marriages.

Standing Marriages, exclusive of the Year's.	Conceptions, exclusive of Column 6.	Proportion of Columns 6 and 5.	Price of Wheat.	Fecundity of the Cheaper of Two succeeding Years.	Fecundity of the Dearer of Two succeeding Years.
1,227,790	182,983	.149	35 8	149	
1,228,722	177,258	.144	44 8	.	144
1,231,698	173,356	.141	47 10	141	
1,235,015	179,384	.145	52 8	.	145
1,239,576	192,174	.155	48 10	155	
1,247,523	188,559	.151	51 10	.	151
1,260,094	192,560	.153	38 10	153	
1,270,268	197,041	.155	41 2	.	155
1,281,025	197,962	.155	45 0	155	
1,290,905	202,234	.156	51 2	.	156
1,302,746	198,920	.153	53 2	.	153
1,317,986	213,817	.162	47 0	162	
1,330,437	206,394	.155	44 11	155	
1,341,581	201,395	.150	48 11	.	150
1,351,570	200,291	.148	51 8	148	
1,356,582	203,067	.149	74 2	.	149
1,364,736	212,181	.155	77 1	.	155
1,376,948	213.320	.155	53 1	155	
1,392,174	206,739	.148	50 3	148	
1,411,165	196,457	.139	67 6	.	139
1,422,530	191,375	.134	113 7	134	
1,425,277	229,384	.161	118 3	.	161
1,428,232	233,844	.163	67 5	.	163
1,453,121	231,675	.159	56 6	159	
1,489,241	235,052	.158	60 1	158	
1,516,703	238,872	.157	87 10	.	157
1,537,302	246,458	.160	79 0	.	160
1,555,082	240,126	.154	73 3	154	
1,574,451	245,162	.155	79 0	155	
1,595,133	243,304	.154	95 7	.	154
1,611,562	248,544	.154	106 2	.	154
1,635,408	244,361	.149	94 6	149	
1,660,575	259,721	.156	128 8	.	156
1,682,981	262,899	.156	98 0	156	
1,700,474	283,062	.166	70 6	.	166
1,729,803	263,570	.152	61 10	152	
1,763,523	270,290	.153	87 4	153	
1,791,280	272,561	.152	90 7	.	152
1,810,825	271,408	.149	82 9	.	149
1,834,934	279,946	.152	69 5	152	
				3043	3069

(7) The facts which the preceding table presents need little explanation. The annual marriages, conceptions, and deaths, as given in the second, third, and fourth columns, are taken from the official reports; the first 20 years from the Population Abstract of 1801; and the next 20, from the succeeding Abstracts of 1811 and 1821. The fifth column contains the proportion of conceptions to each 100 marriages as usually calculated, namely, by dividing the annual conceptions by the annual marriages. The sixth gives the proportion of conceptions belonging to the marriages of that year, (taken at two thirds the number of the latter,) which being subtracted from the whole annual number given in the third column, leaves the annual proportion assumed to belong to the marriages previously contracted, and still subsisting, the number of which marriages, calculated as before explained, is inserted in column the seventh, and the conceptions belonging to them in column the eighth. The proportion of the annual fecundity is obtained by dividing the conceptions by the standing marriages, as given in the two last-mentioned columns, and the quotient appears in column the ninth. The price of the quarter of wheat in each year is inserted in column the tenth. The last two columns give the results sought, namely, the eleventh, the fecundity of the cheapest, and the twelfth, and last, that of the dearest year in each of the 20 divisions.

(8) I divided the 40 years which the table comprises into 20 sections of two years each; comparing, therefore, the years immediately succeeding each other, as to dearness and cheapness, for these obvious and necessary reasons: First, because the fluctuations in the value of money were so great and sudden in some parts of the period in question, that any comparison

formed between years more remote from each other, would have been liable to error, and, indeed, would have constantly led to it. For instance, no one can doubt but that corn in 1792, at 44*s*. the quarter, was, in reality, dearer than at 50*s*. only six years afterward, owing to the revolution in the monetary system, which had taken place in the interval. Second; the great and opposite influence which a state of peace, compared with one of war, has upon the prolificness of the standing marriages of a country, especially such an one as England, which has so large a marine force employed during the latter, rendered it still more necessary that the comparison should be instituted at the shortest possible intervals. Third; the great increase in the population would have given, what it is my constant wish to avoid, a great and undue advantage to my own argument, had sections of a longer period been adopted, and the proof been founded on the extremes they would then have exhibited.

(9) The preceding table, therefore, thus impartially constructed, without pretending to scrupulous exactness, which is plainly unattainable, is, nevertheless, sufficiently accurate, at all events, to decide the question as to whether a rise in corn lowers human fecundity, and contrariwise. In the first place, then, in casting our eyes down the tenth column, which expresses the annual price of wheat, and observing the fluctuations in the ninth, which gives the annual fecundity of the standing marriages, we perceive that such is not the case, but oftener the reverse. And, in summing up the results, whether we calculate the fecundity of marriages by the common method, as given in column five, or by the present one, as given in column nine, we find that the cheap years are in both cases the least, and the dear ones the most fecund. In the last two columns,

the total annual prolificness of each marriage, in the years thus classed, is given; and it amounts in the cheap years to 3043, in the dear years to 3069.

(10) Nor are these divisions of the table formed with a mere view of serving the argument. On the other hand, whether it were divided into equal sections of five years, eight years, or even ten years, the result is the same; the cheapest years are, compared with the dearest ones of each section, the least fecund.

(11) Thus is it that the principle in question manifests itself, though the preceding facts are weakened by a circumstance to which I have already directed the attention of the reader, namely, the influence of war upon national prolificness; thus the year 1800, a very dear one, is a single instance of a striking exception to the rule which I trust I may assert is already established; and I wish, in fairness, to point it out as such. That year exhibits a continuation of that declension in the annual fecundity which had been gradually taking place for some years, and doubtless owing to the pressure of the war, a declension not in the least attributable to the price of grain, as a reference to the preceding year in which it was, comparatively speaking, very cheap, will fully shew. In the succeeding year, however, in spite of a still greater scarcity, amounting to a severe dearth, the average fecundity rose to an unexampled height, though peace had not yet returned: so great was the effect of continued scarcity upon the principle of prolificness.

(12) Indeed, it is not uninteresting to remark that the effect of a severe scarcity seems not only to increase, generally speaking, the prolificness of the current year, but also, that of the ensuing one: for instance, the prolificness of the dear year, 1795, continued into 1796; that of 1801 into 1802, or, to

resign this instance, as the return of peace had doubtless its influence on the conceptions of the latter year, the dearness of 1805 influenced the conceptions of 1806. Lastly, the sudden increase in the prolificness of 1812, the dearest year ever known in England, in later times, continued to, and even increased in, the following one, 1813: which, however, still remained dear. Thus, it seems, that a considerable abatement in the regimen of a country does not only dispose the inhabitants to a greater degree of fertility for the time being, but continues to operate till a more liberal mode of living has again obtained long enough to destroy its effects. It will be seen, I think, in the sequel, that this opinion is perfectly consistent with medical science.

(13) I had constructed the foregoing table, as well as one or two others inserted in a subsequent part of this treatise, before I had adverted to the additions to the marriages, baptisms, and burials suggested in the preliminary observations to the population abstracts of 1811. As these corrections only apply to one half the period, and are proportionate as far as they are made, they do not affect the argument, as founded on the preceding facts, at all, or at least, very immaterially: I shall not, therefore, encounter the trouble of forming another similar one, agreeably to the emendations suggested. It has struck me, however, that a calculation might be made upon a simpler principle, and still less liable to material error than the preceding one; at all events, upon an entirely different plan, and therefore highly desirable in order to shew whether the facts already developed are to be confidently relied upon. In this second computation, I have availed myself of the corrections suggested by Mr. Rickman, which have been just alluded to.

(14) In this second table, then, I attempt to ascer-

tain the number of the prolific marriages, in contradistinction to the whole number existing; and having found that the average term of fecundity in the marriages of the peerage is about ten years, I assign, for obvious reasons, a somewhat longer one to those of the mass of the community, namely, eleven. I add up, therefore, the marriages of the ten preceding years, and assume the sum to be that of the existing marriages, still in a prolific state in the eleventh. I still adhere to the plan of rejecting the conceptions of the marriages of the current year from those belonging to the marriages previously subsisting, as perfectly necessary to any calculation which pretends to an accurate conclusion on the point under consideration, for reasons already stated; but in this case, I take a number of conceptions from those of the year, equal to three-fourths of the marriages celebrated in it, as a more probable proportion of the fecundity which would result from them, than that of two-thirds, which obtains in the peerage, and which, in the former table, I transferred from thence to the entire population, not sufficiently reflecting, that amongst the lower classes, and especially in the crowded districts of the country, first births generally succeed to marriages within the year, and in too many cases, unfortunately soon. The marriages of the current year, which are thus rejected, are added to those of the next term, while the marriages of the tenth previous year are deducted from it. The conceptions, therefore, of any given year, reduced, as before mentioned, divided by the sum of the marriages of the ten preceding years, gives, by this method, the fecundity of those marriages for that year. Many marriages, it is true, and especially amongst the lower orders, are fruitful for a longer term than eleven years; such instances, however, will be more than counterbalanced by the deaths which will take place amongst them before that period has elapsed. I have not noticed the differences in the annual deaths in this method of calculation, which are happily small, comparatively speaking, not more, as Mr. Milne observes, than 10 per cent.; and even that difference is, in all probability, principally occasioned by variations in infant mortality. I must add, that this mode of calculation necessarily cuts off ten of the first years of the preceding table.

(15) I conceive, however, that the intensity in the fecundity of marriages is confined within a term, at least two years shorter than even the last-mentioned one. I have, therefore, added a third table, in which the number of the "teeming females," as Graunt denominates prolific wives, is taken as the sum of the marriages of the eight, instead of the ten preceding years, assuming therefore nine years to be the average term of matrimonial prolificness.

TABLE

SHEWING, FROM THE REGISTERS OF ENGLAND, THE EFFECT

Years.	Marriages of each Year.	Conceptions of the Year.	Of which belong to the Annual Marriages.	Remainder, belonging to previous Marriages, still subsisting and fruitful.
1790	70,648	255,508	52,986	202,522
1791	72,590	269,426	54,443	214,983
1792	74,919	264,028	56,189	207,839
1793	72,880	256,811	54,660	202,151
1794	71,797	254,944	53,848	201,096
1795	68,839	256,781	51,629	205,152
1796	73,107	268,088	54,830	213,258
1797	74,997	270,535	56,248	214,287
1798	79,477	266,769	59,608	207,161
1799	77,557	254,870	58,168	196,702
1800	69,851	237,029	52,388	184,641
1801	67,228	273,837	50,421	223,416
1802	90,396	294,108	67,797	226,311
1803	94,379	294,592	70,784	223,808
1804	85,738	292,201	64,304	227,897
1805	79,586	291,929	56,690	235,239
1806	80,754	300,294	60,566	239,728
1807	83,923	296,074	62,942	233,132
1808	82,248	299,989	61,686	238,303
1809	83,369	298,853	62,527	236,326
1810	84,470	304,857	63,352	241,505
1811	86,389	301,954	64,792	237,162
1812	82,066	314,432	61,550	252,882
1813	83,860	318,806	62,895	255,911
1814	92,804	344,931	69,603	275,328
1815	99,944	330,199	74,958	255,241
1816	91,946	331,583	68,960	262,623
1817	88,234	331,384	66,176	265,208
1818	92,779	333,261	69,584	263,677
1819	95,571	343,660	71,678	271,982

XXXVIII.

OF SCARCITIES ON THE PROLIFICNESS OF MARRIAGES.

Assumed Number of such Marriages, and their Duration.		Annual Fruitfulness of such.		Price of Corn.	Annual Fecundity of Cheap Years.	Annual Fecundity of Dear Years.	Annual average of Fecundity.
1780 69	684,087	2960	Peace.	53 2	..	2960	
1781 90	690,426	3113		47 0	3113		
1782 91	699,248	2972		44 11	2972		
1783 92	711,096	2842	War.	48 11	..	2842	
1784 95	717,689	2802		51 8	2802		
1785 94	720,551	2847		74 2	..	2847	
1786 97	717,841	2970		77 1	..	2971	
1787 96	721,956	2968		53 1	2968		
1788 97	720,505	2875		50 3	2875		
1789 98	729,950	2694		67 6	..	2694	
1790 99	736,811	2506		113 7	2506		
1791 1800	736,014	3035		118 3	..	3035	
1792 1801	730,652	3097	Peace.	67 5	..	3097	
1793 1802	746,129	2999	War.	56 6	2999		
1794 1803	767,628	2968		60 1	2968		
1795 1804	781,569	3009		87 10	..	3009	
1796 1805	792,316	3026		79 0	..	3026	
1797 1806	799,963	2914		73 3	2914		
1798 1807	808,889	2946		79 0	2946		
1799 1808	811,660	2911		95 7	..	2911	
1800 1809	817,472	2954		106 2	..	2954	
1801 10	832,091	2850		94 6	2850		
1802 11	851,252	2970		128 8	..	2970	
1803 12	842,922	3036		98 0	3036		
1804 13	832,403	3307		70 6	..	3307	
1805 14	839,469	3040	Peace.	61 10	3040		
1806 15	859,827	3054		87 4	3054		
1807 16	871,019	3045		90 7	..	3045	
1808 17	875,330	3012		82 9	..	3012	
1809 18	885,861	3072		69 5	3072		
					44,115	44,680	2979

(16) Supposing the marriages of the eight preceding years only are taken, on the average, as expressing the number of the fecund ones in existence; and, rejecting the marriages of the current year, with three-fourths of a conception for each, then the following table will express the annual fecundity of marriages as follows:—

TABLE XXXIX.

SHEWING, BY ANOTHER METHOD, FROM THE REGISTERS OF ENGLAND, THE EFFECT OF SCARCITIES ON THE PROLIFICNESS OF MARRIAGES.

Years.	Sum of the Marriages eight years preceding.	Annual fecundity.		Cheap Year.	Dear Year.
1788	548,859	3560		3560	
1789	549,082	3584		..	3584
1790	556,010	3642	Peace.	..	3642
1791	563,587	3814		3814	
1792	569,890	3647		3647	
1793	575,874	3510		..	3510
1794	577,205	3484		3484	
1795	580,010	3587		..	3537
1796	572,401	3726		..	3726
1797	575,476	3723	War.	3723	
1798	579,777	3573		3	
1799	588,606	3842		..	3842
1800	593,578	3111		3111	
1801	588,505	3796		..	3796

Years.	Sum of the Marriages eight years preceding.	Annual fecundity.		Cheap Year.	Dear Year.
1802	582,853	3899	Peace.	..	3899
1803	601,452	3721		3721	
1804	626,992	3634		3634	
1805	639,623	3678		..	3678
1806	644,212	3690		..	3690
1807	645,489	3612		3612	
1808	651,855	3655	War.	3655	
1809	664,252	3573		..	3573
1810	680,393	3549		..	3549
1811	674,467	3516		3516	
1812	666,477	3794		..	3794
1813	662,805	3861		3861	
1814	667,079	4127		..	4127
1815	679,129	3758		3758	
1816	695,150	3779	Peace.	3779	
1817	704,848	3762		..	3762
1818	709,713	3715		..	3715
1819	718,022	3787		3787	
				58,244	58,924

(17) These last tables present precisely the same result as the first one, namely, the greater fecundity of dear than cheap years; and, moreover, the general

coincidence the whole exhibit in regard to the comparative prolificness of every successive year, considering that they are constructed on such different principles, is a sufficient guarantee of the accuracy of the mode of calculation adopted in each, and of the truth of the general deduction. The last tables, rejecting, as they do, that proportion of the existing marriages which is no longer fruitful, exhibit, of course, greater differences in the annual fecundity of the remainder, and therefore confirm, in a more striking and I cannot but think accurate manner, the principle at issue.

(18) But, perhaps, the preceding tables, especially the first, may be founded upon calculations somewhat too complex for general examination, and, consequently, may not be so satisfactory, as they otherwise might be deemed. To obviate this remaining objection, I shall present the whole of the facts in another form, and one which will only require a reference to public documents, instantly to verify the conclusion. Dividing the term biennially, in order to avoid all possible cavil, and classing the years as before, into the cheaper and dearer ones; and also giving, in this instance, the deaths of each, for the purpose of grounding upon their relative number an interesting remark, these are the naked facts:

TABLE XL.

Shewing, by a further Method, from the Registers of England, the Effect of Scarcities on the Prolificness of Marriages.

Cheaper Years.				Dearer Years.			
Years.	Marriages.	Conceptions.	Deaths.	Years.	Marriages.	Conceptions.	Deaths.
1780	64,309	231,127	198,348	1781	63,768	224,835	195,902
1782	63,071	221,285	187,152	1783	66,287	229,669	188,264
1784	68,935	244,642	194,401	1785	71,549	242,677	191,866
1786	68,992	245,080	185,232	1787	76,448	250,681	184,881
1788	70,032	250,595	187,598	1789	70,696	256,548	185,570
1791	72,590	269,426	186,674	1790	70,648	255,508	184,894
1792	74,919	264,028	188,906	1793	72,880	256,811	203,653
1794	71,797	254,944	197,740	1795	68,839	256,781	210,339
1797	74,997	270,585	191,306	1796	73,107	268,088	190,897
1798	79,477	266,769	187,531	1799	77,557	254,870	189,586
1800	69,851	237,029	208,063	1801	67,228	273,837	204,434
1803	94,379	294,592	203,728	1802	90,396	294,108	199,889
1804	85,738	292,201	181,177	1805	79,586	291,929	181,240
1807	83,923	296,074	195,851	1806	80,754	300,294	183,453
1808	82,248	299,989	200,763	1809	83,369	298,853	191,471
1811	86,389	301,954	188,543	1810	84,470	304,857	208,184
1813	83,860	318,806	186,477	1812	82,066	314,432	190,402
1815	99,944	330,199	197,408	1814	92,804	344,931	206,403
1816	91,946	331,584	205,959	1817	88,234	331,384	199,629
1819	95,571	343,660	213,564	1818	92,779	333,261	213,624
	1,582,968	5,564,569	3,886,421		1,553,465	5,584,354	3,904,580

(19) The preceding table, then, consists, not of calculations, but of facts; and with this I will close my appeal to the statistics of England, on the important question before us, which it effectually decides. Dividing the above term into sections of two years each; in the cheaper of each of these, since the annual registers have been given, there were 1,582,968 marriages celebrated; in the dearer, 1,553,465: in the former, there were 5,564,569 conceptions, but in the latter 5,584,354: so that, though in the more plentiful seasons compared with scarce ones, there were 29,503 more marriages celebrated, there were fewer conceptions by the sum of 19,805! In the dearer years, there were, indeed, 18,159 more deaths, which, it will be observed, were more than compensated for by the superior prolificness of those years.

(20) But it is to the latter half of the foregoing table that I would direct particular attention, namely, the first twenty years of the present century; during which, circumstances have occurred which could not fail to put to the severest test and finally determine the question at issue: I mean those wide and sudden variations in the price of corn, which do, indeed, influence human prolificness, but in a manner directly contrary to what recent writers on the subject of population suppose, or rather, perpetually and confidently assert. In the last twenty years then of the above table, during which time we may reasonably suppose, nay, we are assured that the public records are, upon the whole, kept with greater accuracy, there will be found to have occurred in the cheaper years 873,849 weddings, 3,046,088 conceptions, and 1,981,533 burials: in the dearer ones, 841,666 marriages, 3,087,836 conceptions, and 1,978,728 burials: that is, there were in the dearer

years 32,183 fewer marriages, 41,798 more conceptions, and 2805 fewer burials than in the cheaper ones! So utterly destitute of truth, therefore, is the notion that man " breeds up to the level of food," and that he multiplies in proportion as it becomes more cheap and plentiful.

CHAPTER XVI.

OF THE EFFECT OF SCARCITIES ON HUMAN PROLIFICNESS.

(1) THE opinion that the state of crops influences the principle of prolificness was taken, it appears, from M. Nicander, who applied the observation to the movements of the population of Sweden; and if the effect of variations in the products of the earth in that country had been as described by him, especially in the earlier part of the period to which he refers, still I should deny that the notion which he held, and which has since been attempted to be transferred to this country, is, as a general principle, proved. I mean not to contend that a state touching upon literal starvation is favourable to human increase; I have stated otherwise, where, in discussing the subject physiologically, I have defined more particularly the limits of my proposition, excluding from it the condition of extreme indigence, as I do in fairness, culpable excess, from that which I oppose; and I must refer to what is there advanced on the subject. In the mean time, if the general condition of Sweden is as described by the great advocate of the doctrine against which I am contending, that of "one of the most barren and worst supplied countries of Europe[1]," a state, therefore, little removed from what would be here deemed actual want at any time, and liable to be plunged into instant and universal suffering, by an unusually rigorous season and its concomitant, a failure in the crops, it is obvious that the consequence of the latter must be the disso-

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[1] Malthus, Essay on Population, 6th edit., vol. ii. p. 438.

lution of increased numbers of existing marriages by death, and also a diminution in the usual proportion of annual marriages, both necessarily decreasing the conceptions of such periods, without, however, at all touching the physical question at issue.

(2) But even in Sweden I find the comparative sterility of the unfavourable years indicated but very faintly, if at all; nay, the reverse is sufficiently evident. The years in which the marriages are given, are, indeed, far too few to enable us to come to any very definite conclusions on the subject; I shall, however, calculate the annual prolificness of the standing marriages by the two methods pursued in the first and third tables of the preceding chapter, and also by the more usual mode of dividing the annual conceptions by the annual marriages; and if the several results manifest any considerable degree of coincidence, we may assume the conclusion founded upon them to be correct, notwithstanding the shortness of the period which the table comprises.

(3) A considerable difficulty, however, occurs, in that we have no scale of prices by which we can confidently determine the different degrees of plenty or scarcity which were experienced in these years; in defect of which, we have to be guided solely by the verbal descriptions of the annual crops, as given by the different statistical writers of Sweden. "In drawing "any inferences from them," as it has been very properly observed by Mr. Milne, "it should always be "remembered, that the supply of food in any year de"pends principally upon the crop of the year prece"ding[1]." I have, therefore, in the ensuing table, of course transposed these descriptions of the crops to the year which they would principally affect, namely, the ensuing one.

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[1] Milne, Treatise on Annuities, vol. ii., p. 398.

TABLE XLI.

SHEWING THE EFFECT OF CROPS ON THE PROLIFICNESS OF THE MARRIAGES OF SWEDEN.

Year.	Annual Marriages.	Annual Conceptions.	Annual Deaths.	Proportion of Conceptions to Marriages.	*Conceptions from the Marriages of the Year.	Standing Marriages exclusive of the current Year.	Conceptions exclusive of Column 6.	Proportion of Columns 7 and 8.	Prolific Marriages, being the sum of those of the 8 preceding Years.	Proportion of Columns 7 and 10.	Description of Crop.
1749	19,045	81,940	61,483	4.30	14,284	380,667	67,656	.177	.. ..	..	Poor
1750	20,927	88,141	58,939	4.21	15,695	383,431	72,446	.188	.. ..	..	Poor
1751	21,335	84,368	57,663	3.95	16,002	388,428	68,366	.176	.. ..	..	Abundant
1752	20,922	85,479	60,456	4.08	15,692	393,064	69,787	.177	.. ..	..	Middling
1753	20,089	89,545	54,977	4.47	15,067	398,799	74,478	.186	.. ..	..	Middling
1754	21,994	91,281	64,715	4.15	16,496	401,011	74,785	.186	.. ..	..	Abundant
1755	21,472	89,084	64,982	4.10	16,104	405,055	72,980	.180	.. ..	..	Middling
1756	20,007	81,878	69,161	4.09	15,005	407,422	66,873	.164	.. ..	..	Middling
1757	18,799	83,299	68,054	4.32	14,100	408,630	69,199	.169	165,791	.4174	Scanty
1758	19,484	85,221	74,370	4.32	14,613	406,885	70,608	.173	165,545	.4265	Poor
1759	23,210	91,102	62,662	3.92	17,408	409,060	73,693	.180	164,102	.4490	Middling
1760	23,383	90,075	60,083	3.85	17,537	415,673	72,538	.174	165,977	.4371	Abundant
1761	22,421	89,162	63,183	3.97	16,816	421,603	72,346	.171	168,438	.4295	Middling
1762	21,467	90,152	74,520	4.19	16,100	423,439	74,052	.175	170,770	.4336	Scanty
1763	20,927	91,528	85,093	4.32	15,695	421,100		.180	170,243	.4454	Failure
Average	21,032	87,483	.. ..	..	.. ..	.. ..	.. ..	.177	.. ..	.4341	.. ..

(4) The preceding table exhibits results in precise conformity with those that have been constructed in relation to this country, and proves that in Sweden, even, the abundant years are not the most prolific, but the reverse. Hence, calculated in the usual, and for so short a period, perhaps the best method, we find, by consulting the fifth column, that, on the average, the proportion of annual number of conceptions to each annual marriage was, in the abundant years, 3.98; in the middling years, 4.10; in the scanty years, 4.25; in the poor years, 4.27; and, in the year of failure, 4.32: most exactly, therefore, reversing the supposed order of prolificness under those varying circumstances. Computed on the assumed number of standing marriages, the annual prolificness of each was, on the average of the abundant years, .178; in the middling and scanty years, somewhat, and but little, less; but in the poor years it was .179; in that of failure, .180. Lastly, calculated on the prolific part of the standing marriages, the annual prolificness of each was, in the abundant years, .4371; in the middling years, .4392; in the year of failure, .4454; the scanty and poor years somewhat, but not much, less than the first. Looking at single instances, by the first method of computation, we find a failing year is the most prolific, an abundant one the least so; by the second, a poor year still the most prolific; by the third, a failing and middling year decidedly so. Or, to contrast the results of two extreme years, divested of all calculation whatsoever: in the last year of "abundance" there were 23,383 marriages; a greater number than had, in all probability, ever been celebrated in Sweden in any one year before; and the number of the conceptions of that year, estimated at the number of the births of the succeeding one, was 90,075; whereas, in the year of

"failure," the very word implying extraordinary and extreme distress, the marriages sunk to 20,927, being 2456 fewer than the former sum; and still the conceptions exceeded by 1453, amounting, as they did, to 91,528, a greater number than had ever been previously recorded.

(5) Short as the table is, therefore, it plainly indicates that in Sweden, as elsewhere, a season of hardship is one of fecundity; and this result would, I am persuaded, have been still more uniformly and strikingly apparent, had the term it embraces been long enough to establish, by its results, those general averages by which the final operations of Nature can alone be satisfactorily discovered.

(6) The deaths and conceptions of the same country are given in the work I have been referring to, from the concluding year of the last table, down to the year 1802, accompanied by a description of the crops of every year, which facts are further appealed to in confirmation of the views I have been rebutting; but the annual marriages are not added, and no satisfactory conclusions can therefore be drawn from such partial data. I have, nevertheless, examined these documents sufficiently to pronounce, most unhesitatingly, that nothing can be more erroneous than the supposition that they prove the years of great plenty to be those of superior prolificness. On the contrary, I find the average conceptions of the years designated as "abundant," to be 94,341; of the "middling" years, 95,335; and of the "slender" years, 99,394; or, to obviate objections founded on my having adopted the suggestion of Mr. Milne, and to take, in this instance, the description of the crops as applicable to the current year, still the average of the conceptions of the "abundant" years amounts only to 94,050; while that

of the "middling" ones is 95,317; and the "slender" ones, 99,317! The conceptions in the five years denominated "good," somewhat exceed these, but then they all occur at very near the termination of the table, when the average number of the births had so greatly increased, and therefore it would be most incorrect to take them into the comparison. Nor is it so clear that abundance is even favourable to the preservation, any more than to the production, of life; for, adverting to the column of the excess of births above the deaths, I find that that excess averaged, in the abundant years, only 25,347; and, in the good ones, 25,148; whereas, in the middling ones, it rose to 25,771.

(7) I have not taken into these calculations the decidedly disastrous years, when the crop is put down as "scanty," "poor," or a "failure;" first, because I do not contend, as I have before intimated, that a state of things which such unhappy seasons would produce, in such a country as Sweden is represented to be, could be favourable either to the procreation or preservation of human life; and, secondly and more particularly, because we have no accounts of the annual marriages for the last 40 years of the period, and as we know it to be an universal fact, that the number of the weddings is greatly diminished in scarce seasons, and, on the other hand, as much increased in plentiful ones, it may be expected, from this twofold cause, that the number of the conceptions must, in the latter case, be larger than in the former one; though it is far from being as clear that the existing marriages are not the reverse of being more prolific. On these points, however, it is unnecessary for me to dwell; it is quite sufficient that I have, on examination, found the principle for which I contend abundantly confirmed, in a country and at a

period in which I was even prepared to meet a contrary result.

(8) In closing the argument, as it respects Sweden, I cannot refrain from adverting to the main axiom of this entire work, the truth of which is so fully proved and illustrated by the past and present condition of this interesting country. The table we have been contemplating, especially at its earlier periods, speaks as to the distressing variations in the crops, and the still greater fluctuation in the mortality of the country; so that successive years exhibited, at least in one instance, the appalling difference in the deaths of upwards of two to one; the scanty and scattered population did not produce grain for its own sustenance; and there were not wanting pretended philanthropists, who warned them against permitting the multiplication of their numbers, by arguments drawn from a spurious philosophy, at war with both the feelings and the interests of the species. But the voice of Nature has prevailed; the inhabitants are increased, and are still increasing; hence the climate is improved, the produce is augmented, life is lengthened, and a larger measure of happiness diffused. All this appears from another table which now lies before me, and which I was examining, with a view to demonstrate the principle for which I contend as still operating in Sweden; happily it affords no demonstration founded on great fluctuations in the crops, or distressing variations in the rate of mortality; it speaks, nevertheless, to the heart as well as to the eye, in language far more emphatic than I can use; and I will not therefore withhold from the reader the pleasure it will afford him, when contrasted with the preceding table, relating to the same country, in an earlier period, and when more scantily peopled.

TABLE XLII.

SHEWING THE PRICE OF CORN, AND THE MORTALITY OF SWEDEN, FROM THE YEARS 1821 TO 1825, INCLUSIVE.

Years.	Marriages.	Births.	Deaths.	Price of Wheat per Quarter.
1821	22,890	92,072	66,416	16s. 8d.
1822	24,431	94,309	59,390	18s. 8d.
1823	23,993	98,259	56,067	16s. 2d.
1824	23,907	93,577	56,256	15s. 11d.
1825	23,640	100,315	56,465	17s. 3d.

(9) I am only in possession of the facts that enable me to extend this inquiry to the statistics of France, during eight successive years, namely, from 1817 to 1825. This period was one of general peace; vaccination was already in full operation; nor am I aware of any particular political occurrences in that country which could disturb the effects of those physical causes, be they what they may, which govern the variations in human prolificness. The former of the eight years were the dearest, wheat being higher during that term than in the succeeding four, by almost one half; at least the difference was that between 63*s*. the quarter, and 43*s*. In the first quaternion, there were 832,204 marriages, and, calculated by the births of the succeeding years, 3,566,017 conceptions; the deaths were 3,058,891. In the second, the marriages amounted to 963,063, the conceptions to 3,614,979, and the deaths to 3,031,717; so that the proportion of conceptions to each marriage in the first and dearest period was 4.28 to 1; in the second and cheapest,

3.75 to 1. The deaths were not very different; they were, however, fewer in the last term than in the first.

(10) Many additional proofs might be given of the same interesting principle; but it is conceived they are unnecessary. Should any further confirmation be wanting, it will, I hope, be found in a subsequent part of this work, where the physical proofs of the law of population, about to be developed, will be adduced. The present inquiry, perhaps, ought to have been remitted to that portion of the work with which it seems more properly to class itself. It is conceived, however, that it could not be misplaced in that section of it which is especially devoted to the refutation of those errors, especially numerical ones, which have so long supported the fallacious, and obscured the true principle of population; and in no instance, perhaps, more successfully than when representing that human beings breed up to the level of food, and to the full extent of the funds which they may have at command. It was necessary to demolish this notion, previously to propounding the true theory of human increase.

CHAPTER XVII.

OF THE EFFECT OF THE PREVENTIVE CHECK, OR THE POSTPONEMENT OF MARRIAGES, ON THEIR PROLIFICNESS.

(1) If the method adopted by modern writers on population, in order to determine the comparative prevalence of what they denominate the preventive check is incorrect, the effect they attribute to it, wherever it prevails, is still more erroneous; the former may, by chance, lead occasionally to accurate conclusions; their notions touching the latter, never; being equally contrary to the physiology and experience of the human race.

(2) The opinion to which I allude, and which is universally held by the anti-populationists is, that early marriages are most conducive to human increase; and hence they as unanimously insist upon the necessity of their discouragement, as the best means of repressing what they suppose to be the superfluous numbers of their fellow-creatures. I have already dwelt upon the cruel, loathsome, and disastrous consequences of a successful attempt to carry their principles into effect, in a preceding part of this work; I now proceed to shew that, with a view to the results they contemplate, it would be totally inefficacious. Nature guards her laws too strictly, and accomplishes her ordinations too certainly, to permit any interference which such would now dare to offer, to thwart her in the fulfilment of her immutable and benevolent designs. Human folly and tyranny may go, and indeed have gone

certain lengths, in either indirectly or authoritatively postponing the period of marriages; but such attempts have been founded in ignorance, and, like all other contentions against the institutions of Nature and of God, have only served to cover their abettors with shame. The fact is, that the preventive check, in the ordinary acceptation of the term, does not diminish the fecundity of those marriages which it postpones; all the evil and mischief it perpetrates are therefore perfectly gratuitous.

(3) But before I proceed to the proof of this important position, it seems necessary to define the term "preventive check," which is one of the most convenient vaguenesses imaginable, especially when further qualified by those "oscillations" with which its advocates perpetually accompany the pretended proofs of their system. "The great sophism of all sophisms," says Bacon, "is equivocation, or ambiguity of words and phrase;" it is one, however, to which the anti-populationists are perpetually resorting, who leave to their opponents the unreasonable task of defining the very terms of the system they have to disprove.

(4) I understand, then, the phrase, "preventive check," as not to mean, on the part of those who use it, the wish, were there the power, of inflicting perpetual and involuntary celibacy on any portion of the community, accompanied by all the unrehearsible consequences to which such a sentence would doom the majority of its victims; nor, secondly, would I charge its abettors with a design of putting off marriages till the period of prolificness was past, or near its termination,—a more disgusting proposition than the former; nor, thirdly, of postponing them, as it regards the female sex, till the season of their youth should have almost passed, and their beauty should be evidently on the wane, and

when, consequently, they would have lost much of the power of exciting, or of permanently retaining, affection. I fear, however, there are not wanting those who would push to its utmost limits a system, which would, "like a worm in the bud, feed on the damask cheeks" of their fair, but humble, countrywomen; and who would rejoice to see the "maidens" of England not given in marriage till they had become "*vieilles filles.*" Thus Mr. Malthus contemplates twenty-eight or thirty[1] as a very auspicious period of life for female marriage, which he has latterly, I see, reduced to "twenty-seven or twenty-eight[2];" forgetting, it is to be hoped, the inevitable calamity that such a postponement would inflict upon their offspring and the country at large, by increasing the number of orphans so vastly; to say nothing of the immoral consequences which would inevitably ensue. But again, investing the subject with convenient indistinctness, he says, "the most eligible period cannot be fixed;" but in asserting a supposed superiority in the condition of the females who should thus defer marriage, compared with those who are "involved in the cares of a large "family at twenty-five," he evidently shews that, by a very early marriage, he means one which takes place at, or soon after, the period of puberty. He constantly maintains that within, I presume, reasonable limits (for out of these it would be absurd for either side to pursue the inquiry), these earlier marriages are, on the average, more prolific than the later ones; he holds, therefore, the necessity of repressing the former as much as possible, even to the extent of abrogating the national charity, conceiving them to be the main cause of what he deems an injurious increase in the population of the country. After having proved, as he supposes, the principle of population as the occasion of nearly all the evils that afflict society everywhere, what he calls the "preventive check" makes up the sole remedial part of his system. I totally deny the consequences of this check, as propounded by himself, and shall shew them to be directly the contrary to what he supposes; and I shall do this, not by a series of assumptions and assertions, but by proofs which I shall proceed to state, and which will be resumed in a subsequent book of this work, of a nature that will, I conceive, defy contradiction. It is needless, I think, to beseech the reader's earnest attention to this part of the subject; its extreme importance, in a moral and political point of view, is abundantly apparent.

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[1] Malthus, Essay on Population, p. 498.

[2] Ibid., 6th edit., vol. ii., p. 276.

(5) It would be a waste of words to prove that a postponement of marriage on the part of the male sex only, to any extent which could be reasonably contemplated, would not have the effect of diminishing the prolificness of marriages; the term of male fecundity being so much longer than that of the other sex, and, indeed, almost doubling it in its possible, and far more exceeding it in its actual average duration, as will be shewn more particularly hereafter. It will also be as distinctly proved that this would not have the effect of disturbing the relative numbers of the sexes at the usual period of marriage; but that the diminution in the number of the males arising from the mortality which takes place during the term of such postponement, which would otherwise consign a number of females equal to the excess of the male deaths, to involuntary celibacy, Nature has anticipated and provided for, by a compensatory law hereafter to be explained. And were such not the case, could any thing be more cruel or unnatural than the effects of the preventive check, as operating upon the sex?

In the mean time, as the advocates of that check do not disguise its moral effects, especially on the male sex, any more than others, seeing that it would not diminish the fecundity of their marriages when they should take place, I would ask, whether it would not greatly increase the number of illegitimate births during the period of their postponement? The population would doubtless be increased, and by the most unfortunate of human beings. It is thus, as it regards the male sex at all events, that this "juggling fiend," the preventive check, would "keep its promise." But it is evidently to the female sex, and to their infant offspring, that this kind and tender system adverts throughout: let us, therefore, proceed to examine the effects which the preventive check, as before explained, would have on them.

(6) First, then, the measure of female prolificness is determinate. This was the avowed opinion of the greatest physiologist probably that ever existed, John Hunter. He held that the human ovarium was only capable of producing a certain and definite number of ova: a view of the subject general, I believe, in the profession. Nor is this doctrine left unsupported by comparative anatomy; it is fully confirmed, indeed, both in the animal and vegetable kingdoms. In the latter the fact is at once obvious; especially as it regards plants: wheat, for instance; the extent of its fertility is, after maturity, always fixed and numerable, however the principle of production may have been previously evolved. Hence the idea of the celebrated Ray may be as properly applied to vegetable as to animal life; he believed that "the females, as well of "beasts as birds, have in them, from their first forma- "tion, the seeds of all the young they will afterwards "bring forth[1]," and which are successively produced:

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[1] Ray, Wisdom of God in the Creation.

a principle which, if true, is of necessity traceable up to the original of every species in nature, and which, therefore, exhibits creation as comprehending, from the first, every existence which should be developed to the last pulsation of time, presenting, therefore, the perfections of the Deity, in a form the most overwhelming and infinite that the human mind can possibly conceive[1].

(7) But to return to the immediate subject.—The measure of prolificness being thus defined and limited, it is interesting to observe with what care Nature seems to guard against being defeated in her purpose of producing it. This is observable even in the vegetable tribes, as will be seen hereafter, when the physiological part of the argument will be more distinctly discussed; it is still more strikingly the case in the animal kingdom, of which one instance shall suffice, being that given by Lord Bacon. Of birds, I think, he observes, that by a kind of natural arithmetic, they know the proper number of eggs which they ought to incubate, and adds that he made an experiment by regularly abstracting one from a certain nest, for a long time together, and always found that the deficiency was supplied before incubation commenced; and he remarked, that if the whole of them with the nest were even destroyed ever so often, they would fall to building again[1]: rendering it probable, therefore, that no "check" short of killing the parent bird, or persecuting and disturbing her in her purpose, till the season should have rendered its accomplishment impossible, would defeat the calculations of Nature relative to her ultimate increase: calculations which, transferred to human beings, our writers upon population pronounce to be excessive and pernicious.

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[1] See the great Harvey's Work, De Generatione Animalium.

(8) Something very similar to this occurs, as it regards the human species, though it is accomplished in the former case by instincts, which, in some sort, seem dependent upon volition; in the latter, by adapting the involuntary physical laws of our nature to the end designed. Thus, when the preventive check is made to operate, it is astonishing how the very laws which regulate human prolificness acquire additional energy, and even change, in order to thwart its pernicious interference; and this observation brings me to the subject under immediate consideration.

(9) When the preventive check has therefore actually postponed marriage, so as to render the degree of prolificness contemplated by Nature apparently more difficult, or, under usual circumstances, impossible to be evolved, then is it that those counteracting circumstances take effect which it is the purpose of the present chapter to unfold. And first, the term of female prolificness is lengthened; or, second, the intensity of the prolificness, during what remains of its customary duration, is increased. The former of these is the most rare and singular instance of the accommodation of the generative system to the exigencies of the case in which it has to operate; it is nevertheless true that "when women marry late in life, the post-"ponement of the generative energies will carry the "period of prolificness beyond the fiftieth year[1]." But this is a case which can rarely be observed upon. The second particular is that to which I must direct especial attention, as involving, in effect, the matter at issue; and as it relates to the whole question of the comparative prolificness of early and late marriages, I shall discuss it accordingly. I must, however, premise

[1] Dr. Mason Good, Study of Medicine, vol. v., p. 11.

that, as a succession of a given number of early marriages would increase a community more rapidly than the same number of later ones equally prolific, by crowding a greater number of co-existing generations upon each other, if in both cases Nature equally accomplishes her purpose, that of replenishing without surcharging the population, so it follows that, in order to accomplish this, the former, namely, the earlier marriages, must be less, and the latter, the later ones, more prolific of children: and it is so. At all events, if there be a difference in their effects, it is this: the earlier connexions add permanently the fewest to the general increase of any community: a fact which I now proceed to prove; and in the first place by general assent, before the selfish and pernicious principle I am combating, deemed it necessary to put forth a contrary doctrine.

(10) Aristotle, speaking of early marriages, says expressly[1], "The conjunction of young persons is bad for the procreation of children." His own language is given below, because, as before observed, this author is said to have been mistranslated on this subject. This great philosopher further delivers himself upon this important subject, agreeably to the plainest dictates of common sense, and the universal tenour of human experience. "To the female sex, premature wedlock "is peculiarly dangerous, since, in consequence of "anticipating the demands of Nature, many of them "suffer greatly in child-birth, and many of them die[2]." This fact he also observes to have been confirmed by an oracle to the Trœzenians, when many amongst them perished by marrying too young[3].

(11) But this philosopher has not only thus pro-

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[1] ἔστι δὲ ὁ τῶν νέων συνδυασμὸς φαῦλος πρὸς τεκνοποιΐαν. Arist. De Repub., l. vii., c. 16, op. p. 446, A.

[2] Arist. De Repub., l. vii., c. 16.

[3] Ibid., l. vii., c. 16, op. p. 46, B.

nounced on the effect of early marriage as injurious to the health and even life of the mother, and as adverse to the procreation of offspring, but likewise on its pernicious consequences, as it respects the constitution of that offspring; each of which circumstances, considered separately, it must be quite clear have a great and necessary influence on the question, and unitedly, absolutely govern it. Regarding the last point, therefore, he says, "Premature conjunctions produce imperfect offspring, females rather than males, and those feeble in make and short in stature. That this happens in the human race as well as in other animals, is visible in the puny inhabitants of countries where early marriages prevail[1]." It is quite evident, therefore, that he connects a higher degree of mortality, as well as a smaller one of prolificness, with early marriages. Such are the deliberate views of this great light of antiquity; who, I am persuaded, has left little to be added on this important subject, and who in this, as in many other particulars, better merits the title of an inductive philosopher than not a few of those who pronounce upon him as a theorist without having ever consulted him.

(12) And that the legislation of antiquity was founded upon its philosophy in this respect demands little proof. It was one of the first objects of the lawgivers of old to encourage population, and the necessity for their so doing is sufficiently plain, from the history and ultimate fate of all the free states of antiquity. And of all the legislators of any time or country, this was probably more particularly the object of Lycurgus; hence with the very same design that he took every means to promote universal marriage, and consequently rendered celibacy peculiarly disgraceful,

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[1] Aristotle, De Repub., b. iv., p. 246, Gillies' Translation.

he inhibited the early marriages of females, postponing that connexion till they were in the full vigour of life. This period, as Lord Bacon has observed, some have supposed to have been twenty-five, others three years younger[1]; either of these ages, however, may be deemed decidedly late, in reference to the period of female pubescence in that part of the world, where it is confessedly early[2]. That I am putting no modern gloss upon the intention of Lycurgus in this respect is very clear. Plutarch says expressly, that the later marriages of the Spartans tended more to the procreation of children than the earlier ones of the Romans[3]. And the ideas of the latter people upon this point may be easily gathered from the observations of their best writers on the prolificness of the ancient Germans, which they evidently connect with the custom of not marrying early.

(13) It would be an endless task to enumerate modern authorities to the same effect: I shall, therefore, confine myself to two writers only, but who probably gave more attention to the various facts regarding population, than any other individuals either before or since their time. Dr. Short notices that very early connections are not equal in prolificness to more mature and well timed ones; and, indeed, far the reverse in regard to their ultimate effect on human increase[4]: and Susmilch, who wrote his work with an express view to point out and promote the best means of increasing population, after having accumulated an unprecedented number of facts relating to his subject, declares, that "too early marriages are injurious to population." He even classes them with too late ones, as to their pernicious influence in that respect,

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[1] Bacon, Works, History of Life and Death.

[2] Holland's Travels in Greece, p. 154.

[3] Plutarch, Numa. Universal Hist., Ancient part, vol. v., p. 388.

[4] Dr. Short, New Observations, &c., pp. 63, 64.

and exemplifies his views upon the subject by the analogy of nature: "experience," says he, "shews "this in animals; as for example, among great cattle, "the cow, which has a calf too young, never comes to "the size and strength which she otherwise would have "done[1]." Of this principle Virgil was fully aware; hence, he says,

> Sed non ulla magis vires industria firmat,
> Quàm venerem et cæci stimulos avertere amoris,
> Sive boûm, sive est cui gratior usus equorum[2].

I might again appeal to the very same principle in the vegetable kingdom; for instance, there is not a horticulturist who is not fully aware that premature fruition is injurious to the growth and future prolificness of all the fructiferous tribes in existence.

(14) Such is the general experience of mankind upon this important point, to which, however, those who are prepared to outrage human feelings in behalf of their system, may be little disposed to attend. To them I submit the following indisputable facts, fully conforming to, and corroborative of, the preceding view of the subject; challenging them, at the same time, to disprove their truth, or evade the demonstration they afford.

(15) For the information contained in the following table the public are indebted to Dr. Granville, who has conferred an incalculable benefit on political, as well as medical, science, by having recorded the circumstances on which it is founded. On his register of all the important circumstances regarding 876 cases of parturition, which he attended in quality of physician to the Benevolent Lying-in Institution and the Westminster Dispensary, the following facts, applicable to the present subject, appear, as calculated by

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[1] Susmilch, Gott. Ordnung., vol. i., p. 184. [2] Virgil, Georg., l. iii., p. 209, 211.

Mr. Finlayson. The first column gives the ages of the females when married, and the second the average number of births for each year of marriage. The table is divided into sections of four years, as appears to be the case in the document referred to, only I have given the mean annual amount of each quaternion, which is not done in the original.

TABLE XLIII.

SHEWING THE EFFECT THE POSTPONEMENT OF THE MARRIAGES OF FEMALES HAS UPON THEIR ANNUAL PROLIFICNESS.

Ages when Married.	Average Number of Births for each year of Marriage.
From 13 to 16	.456706
16 to 20	.503610
21 to 24	.520227
25 to 28	.545163
29 to 32	.589811
33 to 36	.776866
37 to 39	1.125000

(16) The facts exhibited in this table need no comment. They clearly evince that the annual fecundity of marriages regularly increases in proportion as the period at which they are contracted is postponed, provided, of course, that period is within the limits to which Nature, for obviously necessary and beneficent reasons, confines the fertility of the human female. If we couple this fact with another, very important to the right understanding of the subject before us, namely, that marriages, on the average, are only fruitful for about a third part of the term of possible fecun-

dity, (at least such is the assumption of those who have attempted to estimate the fruitful portion of the standing marriages of a community,) I think it will be difficult to deny, with any shew of reason or truth, that the preventive check would have an effect on the increase of population exactly opposite to that which its advocates imagine. But another fact remains to be noticed, which will make that conclusion still more certain; namely, the greater degree of mortality which attends the offspring of early marriages: a circumstance of which, it has already been shewn, the philosophers and legislators of antiquity, as well as the most diligent observers in modern days, have been fully aware. This will fully appear from the following table, taken also from the facts supplied by the document already appealed to. The first column again expresses the ages, classed, as before, into sections of four years; the second, the marriages which took place in each period; the third, the living births of such marriages; the fourth, the surviving children of those births at the period of the last pregnancy; the fifth, which gives the difference between the two last mentioned columns, expresses, of course, the deaths which had occurred amongst the whole number of the children; and the sixth, and last, shews the proportion of mortality to a living birth which occurred on the average of every such section, and is, therefore, the result sought.

TABLE XLIV.

SHEWING THE EFFECT THE POSTPONEMENT OF THE MARRIAGES OF FEMALES HAS UPON THE MORTALITY OF THEIR OFFSPRING.

Ages when Married.	Number of Marriages.	Number of living Births.	Children alive at the existing Pregnancy.	Deaths of Children.	Proportion of Mortality to each Birth.
From					
13 to 16	74	376	209	167	.444149
17 to 20	354	1307	751	556	.425401
21 to 24	282	823	474	349	.424058
25 to 28	110	287	170	117	.407665
29 to 32	38	67	46	21	.313433

(17) It will be observed, that I have carried the foregoing table no further than the termination of the thirty-second year. The numbers of the marriages after that age are, in the original document, very few and irregular in their results. Should it be thought necessary, however, to proceed in the comparison, it may be done by reference to its last column but one, when it will be seen that the annual average number of the surviving children increases to the last; the first section giving that proportion as .182225; that from 33 to 36, as .237643; and the last, consisting of two years only, namely, 37 and 39, as .250000. It will be time enough, however, to argue about the effects of postponing the marriages of the females till after the thirty-third year, when any one is found besotted enough to dispute concerning a proposition which, if carried into effect, would fill a nation with orphans from one end of it to the other, and when, therefore,

the population, whether few or many, would be superfluous indeed!

(18) It may be, perhaps, objected to the whole of the foregoing proofs, that they are derived from a register which cannot profess to give the whole number of children which the marriages it records shall produce, from their commencement to their termination, but only those which have been born to each up to a period within those limits, all the facts which it can record being necessarily retrospective ones. I shall, therefore, proceed to another series of proofs of the same principle, which will at once silence every such exception, and afford a strong additional demonstration of its truth. These are derived from the registers of the peerage, which, as I have observed elsewhere, I have gone through in order to collect a body of authentic facts illustrative of many of the principles advanced in these volumes. As far as they relate to the subject before us, those facts are as follows.

Table XLV.

Shewing the Effect of the Postponement of the Marriages of the Peeresses on their Prolificness, and on the Mortality of their Offspring.

Ages of the Peeresses at Marriage.	Number of Marriages.	Number of Children.	Deaths of Children before the nubile Age.
12	2	8	4
13	5	18	7
14	5	17	4
15	20	98	25
16	31	149	35
17	40	148	34
18	49	256	52
19	52	244	45
20	48	245	53
21	58	324	63
22	50	265	51
23	42	199	28
24	34	226	44
25	24	96	12
26	14	56	6
27	18	87	18

(19) The above table, which commences with the earliest period of female marriage in the registers of the peerage, and proceeds fifteen years beyond it, divided, as the preceding ones, into sections of four years, gives the following results in each division; first, the average prolificness of the marriages; secondly, the proportion of deaths to a birth, previously to the latter

attaining the average nubile age; and, thirdly, the actual increase, or the balance of the two last proportions.

TABLE XLVI.

SHEWING THE EFFECT OF THE POSTPONEMENT OF THE MARRIAGES OF THE PEERESSES, ON BOTH THEIR PROLIFICNESS AND THE PRESERVATION OF THEIR OFFSPRING.

Period of Marriage.	Number of Marriages.	Number of Children.	Deaths of Children before the nubile Age.	Births to each Marriage.	Proportion of Mortality to a Birth.	Permanent Increase.
12 to 15	32	141	40	4.40	.283	3.15
16 to 19	172	797	166	4.63	.208	3.66
20 to 23	198	1033	195	5.21	.188	4.23
24 to 27	86	467	~~1~~80	5.43	.171	4.50

(20) Thus, then, does it plainly appear that amongst the wealthy as well as the poor the same law of Nature prevails; and, consequently, it is universal. As far as the preceding table goes, not only are the marriages more prolific the longer they are deferred, but the deaths in their offspring are, proportionably, less numerous; causing, therefore, by this inverse ratio of fecundity and mortality, the later marriages to be far more conducive to permanent increase than the former ones. Beyond the limits of the preceding table, the marriages of females, most especially in this rank of society, become comparatively few in number; and when they do take place in the peerage, they are principally contracted with widowers, or with males at a considerably advanced period in life. I may, however, remark, that I could have extended it to an additional section of four years, that is, up to the thirty-second, and have

shewn that the later divisions were still more prolific than the former ones, and even the last than the first; at least, as it respects permanent increase. Indeed, it is singular that the last-mentioned year, the thirty-second, is, of all I have in my original table, the most prolific. But this, I repeat, it is unnecessary to do: no man contemplates so atrocious a proposition as that of carrying the preventive check to any such lengths; and if he did, the folly of the attempt would be abundantly sufficient to counteract it.

(21) But it is evidently impracticable for me to present the facts in detail, upon which the last proof of the principle at issue is founded, as to do so would be, in effect, to publish a remodelled record of the peerage of the kingdom; and as some, perhaps, may be disposed to doubt either the accuracy or fidelity with which I have presented the results, which I have deduced from my own careful examination of that voluminous public record, I shall dwell no further on the demonstration, conclusive as it is to myself, but proceed to an appeal, of a nature far more public and general, with which I shall close the inquiry; though by so doing I shall, in some measure, forestall a part of the argument which has, hereafter, to be pursued more into particulars.

(22) I need not premise that the prevalence of the preventive check, in the same country, is, generally speaking, sufficiently indicated by the proportion of the marriages to the population; and that where these are more numerous, they are, unquestionably, more early also. The following table, then, which is only a short synopsis of others, which will follow in their proper place, including, as it does, all the countries where the facts necessary for the determination of the question are known, will finally settle the question.

TABLE XLVII.

SHEWING THE EFFECT OF THE "PREVENTIVE CHECK" ON THE FECUNDITY OF MARRIAGES IN ENGLAND, BOTH IN TOWNS AND THE COUNTRY AT LARGE; ALSO IN FRANCE, PRUSSIA, AND THE KINGDOM OF THE NETHERLANDS.

Marriages to the Population one in	Average Births to each Marriage, in				
	England.	Towns of England.	France.	Prussia.	Netherlands.
— 100	2.43	2.46	..	4.24	3.09
100 to 120	3.76	3.22	3.79	4.33	4.89
120 to 140	4.07	3.71	3.98	4.49	4.96
140 to 160	4.28	4.25	4.39	4.62	5.18
160 and upwards.	5.18		4.66	..	5.32

(23) Thus is it, that arithmetic decides, touching "the preventive check," which has been put forth as the redeeming feature of a system that, with equal ignorance and presumption, pronounces on the redundancy of human beings, and teaches, that this hateful expedient is the sole redress of the wrongs which Nature otherwise would inevitably inflict upon her offspring. It is difficult to say, whether the folly, the cruelty, or the crime of acting upon such a notion would be the most conspicuous.

CHAPTER XVIII.

OF THE COMPARATIVE CORRECTNESS OF REGISTERS, AND ON THE CONTINUATION OF THAT INCREASE IN POPULATION WHICH THEY AT PRESENT INDICATE.

(1) BEFORE concluding this exposition of the numerical errors on which the modern theory of population is mainly founded, a few words are due to the examination of those rates of increase which have been deduced from the censuses of different countries during the present century, since the commencement of which this branch of national statistics has been generally attended to. Circumstances have existed, which have been insufficiently noticed, affecting the correctness of these deductions; and others during the same period have also occurred, fatal to the accuracy of all computations which extend to successive periods in any country the rate of increase that seems to have taken place during this: I mean circumstances totally unconnected with that law of population about to be developed, and which will prove that such calculations are directly contrary to the immutably established laws of Nature. I shall confine my observations to this country, and if they are true, they are equally applicable to all others.

(2) To advert then to the three censuses of this country, in the years 1801, 1811, and 1821. The first was unquestionably deficient, and among other reasons for this in particular, because no inconsiderable proportion of the people regarded the measure as, in one way or other, preparatory to some further fiscal,

or military regulation. Its deficiency, however, has been, in some degree, supplied by Mr. Rickman, whose talents and industry, displayed in arranging and publishing our censuses, considering their nature, are beyond all praise. The succeeding one of 1811 would probably be less incorrect; but still, the former suspicions could not have been yet entirely allayed, the country remained under similar circumstances, being still at war, and subject to increasing imposts. The third, and last, was doubtless the least deficient, as it is in the nature of these enumerations to become the more complete the oftener they are taken, and as the altered circumstances of the nation had completely allayed those apprehensions, which, however groundless, I well remember to have been prevalent.

(3) Now, if the preceding statements are correct, and there was a deficiency in the amount of the first census, and also in the second, though considerably reduced, but in the third, if the numbers may be considered complete, as Mr. Rickman shews was in all probability the case, it follows, of course, as an arithmetical fact, that the rate of increase in the population in both periods, as calculated on the apparent numbers at the commencement and termination of each, has been overstated, and the calculation necessarily errs in excess, by the difference which the proper rectification of the foregoing censuses would create. I conceive this fact is too clear to need exemplification; I will therefore proceed to substantiate the assumption on which it is founded, by something more convincing than general admissions, however reasonable; confining the proof to an examination of the two last censuses, and to the female divisions of each, in order to obviate any objections that might be grounded on

circumstances which have doubtless occasioned, in the interim, great fluctuation in the male part of the population.

(4) The total number of females, of all ages, returned as in existence in the census of 1811, was 4,963,064; those in that of 1821, 5,777,758; exhibiting, therefore, an increase during the interval, of 16.42 per centum. The last I hold to have been sufficiently, and perhaps almost precisely accurate; but that the former was deficient, and consequently that no such increase occurred during the interim, and I prove it thus:—the survivors of the whole of the population of 1811 would be, in 1821, ten years of age, and upwards. In the last census the sexes are further divided into ages, and of the age of ten and upwards, I find there are 3,659,757 out of the 5.021,563, being the whole amount so discriminated. But the whole number of females, as before stated, was 5,777,758, leaving 756,195 therefore as unclassed. Now, admitting that this deficiency was proportionate throughout all the classes of the census (and to suppose otherwise, would still further aid the conclusion at which I aim, as the enumerations were less likely to be defective in the adult than in the infant population,) and then the proportion above ten years of age of these 756,195 would be 551,121, which, added to the 3,659,757 actually enumerated, make in all 4,210,876 out of the 5,777,758 ten years old and upwards, and consequently the survivors of the 4,963,064 females of all ages existing in 1811.

(5) But this is impossible. Out of 4,963,064, a large number of whom must, of course, have been children, and a due proportion of the rest at an advanced age, 4,210,576 could not have been in existence ten years afterwards. In that case 752,488 only

would have died out of the former number during that whole term, or less than 75,249 per annum. Such an idea is quite preposterous; it would give an annual demise of far less than one in threescore, which is even much less than the most flattering computations of our actuaries, which, by-the-bye, are becoming preposterously incorrect. Let these, when they are determining what they denominate the general expectation of life, include infant mortality, which, whether they reckon it or not, will enter most materially into the computation, and they will find that their late notions are totally irreconcileable with matter of fact, as established by the universal observation and experience of mankind up to the present hour.

(6) To the scandal of those whose situation has enabled them to afford it, this country possesses no series of authentic facts whereon to calculate, accurately, the expectation of life and the law of mortality prevailing in the general population. Mr. Milne has given a table, in which those facts, relative to Sweden, are determined: and in adverting to one of these, I find that the following proportions are given in that country; where I am yet to be convinced that the law of mortality is otherwise than highly favourable to human beings, or that its being apparently otherwise, is attributable to any thing else than a more accurate attention to the registers, especially as it regards deaths Still confining ourselves to the female division, 367,567 females, of all ages, diminish ten years afterwards to 297,700, or, in other words, lose by mortality, during that term, 69,867 of their number. Applying the same rule to the female population of England, the 4,210,576 females in the census of 1821 of 10 years old and upwards, must have survived from 5,198,753 in existence ten years before, in

which case the increase would have been 11.14 instead of 16.42 per annum. But were we to admit that the mortality in Sweden is, on stationary numbers, one in ten more than in England, a difference which I will not credit, except on better evidence than any I have yet seen, then the diminution in ten years would be in the latter country as 367,567 to 304,687; consequently, the 4,210,576 of ten years old and upwards would have resulted from an entire population (of females) of 5,079,536. The increase then would have amounted to nearly 13.75. But from an entire population of 4,963,064 persons, comprising all ages, consequently, a large proportion of infants, and the usual one of aged persons, that 4,210,576 should survive ten years afterwards, is a position which I think no individual, in the least degree accustomed to calculations relative to the law of mortality, will be found to maintain. I infer, therefore, that the census of 1811 is deficient, and that when compared with that of 1821, the increase the latter exhibits errs considerably in excess.

(7) Under the thorough persuasion, therefore, that the census of 1811 was, as compared with the last, deficient in its amounts, I have in some of the calculations, which will appear in the succeeding book, taken the mean population of the term between 1811 and 1821, at the half of the sum of both periods; though in a number increasing in a regular ratio, that method would somewhat exceed the just amount: under the circumstances mentioned, however, it is conceived it more nearly expresses it than would the results if calculated by the more exact computation.

(8) But to return. To the diminution in the apparent rate of increase which must occur from the increased accuracy of succeeding registers, must be

added other causes, independently of that about to be developed, which prevent us from believing that its present rate in this country, and throughout Europe, can be permanently maintained. These I shall class under one general head, namely, the effect of the improvement in the duration of human life on the present increase of population.

(9) In briefly discussing this point, I shall not allude particularly to the effect of the introduction of vaccination during the period to which we are directing our attention, and in which, indeed, the principal increase in the population of Europe has taken place; though I am far from thinking that that circumstance ought not to enter into the computation. In calculating a rate of increase, by comparing the population at two periods, under such different circumstances, in the first of which it was very partially, if at all affected by that great discovery, and in the last, so greatly influenced by it, we are comparing things essentially different. But I shall not, I repeat, allude particularly to this circumstance, but confine myself to the general improvement in the term of human existence, which, from whatever cause, has undoubtedly occurred during the same term, and has, as certainly, occasioned a considerable part of that increase which has lately become universally noticed.

(10) It appears to me perfectly clear, that so much of the rate of increase which results from an improvement in the term of human life, and which has taken place contemporaneously with it, will not be continued, when the expectation of life, though remaining thus improved, and the law of mortality again become stationary, which they must do, unless we are to entertain the notion of some of the French philosophers, who held the improvement in the term of human

existence to be indefinitely progressive, and who even anticipated the period when man would, perhaps, become, literally speaking, immortal.

(11) I had constructed a set of tables, shewing the effect of the improvement of life on the ratios of human increase, with a view to prove and exemplify the present argument, but I omit them, as wholly unnecessary; as it has since struck me that a simple illustration will shew this fact more clearly than a series of calculations. Let us, in order to divest the instance as much as possible of extraneous considerations, take a community stationary in numbers, in which there are annually one thousand births, and as many deaths, the expectation of life being thirty years; the entire number would then be 30,000, and it would continue stationary so long as the law of population, including that of mortality, remained the same. But supposing the expectation of life to be gradually improved, till at length every birth should survive to forty years, it is evident, that, all other circumstances remaining the same, as the population became composed of these improved lives, a regular increase from the same number of births would take place, and that it would continue till, all surviving to the age of forty, the population would rise to 40,000; being an increase of upwards of 33 per cent. during the term in which the improvement was taking place. But after that time, it is equally clear that, though the same favourable rate of mortality should continue, the increase would entirely pause, and the community would again become permanently stationary in numbers. Precisely the same consequence has an extension of the term of life on an increasing, as on a stationary population, though its effect cannot be quite so clearly distinguished; nor its exact share in the general increase be accurately calculated. Now this extension in England

during the last fifty years, is supposed by some to have been equal to one-third of the duration of life.

(12) It is, therefore, quite certain, that no inconsiderable part of the increase, which has occurred during the time this improvement in the term of human life has been taking place, in this and other countries, is attributable to that cause; and that whenever that term shall again become stationary, so much of it as is so occasioned, will cease. What the future advance in the numbers of human beings may be, we shall not venture to calculate, but, other circumstances remaining the same, that it cannot be nearly so rapid, is abundantly clear; the effects of the improvement in the rate of mortality, will however probably continue to appear in another census or two, for reasons which need not be further explained.

(13) In estimating, therefore, the future ratio of increase in this or any other country, we must first make due allowance for the supposed (and in the instance of ours, certain) deficiencies which have occurred in the earlier censuses. We must also include in the computation the transitory effect, on that ratio, of an improvement in the expectation of life, and then we shall arrive at just conclusions on the subject, and they will be found very different to those that are usually appealed to in proof of the novel ideas on the subject of population.

(14) Similar deductions to the foregoing might be drawn also, from a comparison of the number of births on the average of, for instance, five years preceding the three several censuses; when, notwithstanding the known fact of the greater correctness of the registers of the latter, compared with the former, part of the period, the increase of the births is far from justifying the assumption of a permanent advance in the population equal to that apparently exhibited by the censuses.

(15) Perhaps no facts can be clearer, certainly none more cheering, than those now presented, namely, that under proper treatment the numbers, health, and happiness of human beings advance by simultaneous steps. In this progression of population, the domestic and social virtues are conspicuous, public prosperity is promoted; and the triumphs of agriculture and of the arts are extended in every direction; while a longer term is allotted to this scene of enjoyment, by the happy circumstance to which we have been especially alluding, the increasing longevity of the human race. In what sort of attitude, then, does the system place itself, which deplores this increase as the greatest of public evils, and recommends the sum of human existence, as well as the measure of its enjoyment, to be limited according to the dictates of its wretched and degrading dogmas? professing to demonstrate its principle by a series of calculations, which are as erroneous in themselves as they are injurious to human beings, and insulting to the great and universal Parent. One of the most powerful of the causes of that augmentation of mankind, which its advocates pronounce to be excessive and pernicious, is, as we have shewn, the improvement in the duration of life, the consequence of which is, in almost all their computations, wholly overlooked. The effect is inseparably connected with causes which it seems strange indeed to deplore. If it have pleased Divine Providence, in token of his complacency, to cause the shadow of mortality on the dial of life to go back some fifteen degrees, instead of murmuring at so gracious an interposition, let us elevate our hearts with that gratitude, which, to be acceptable in His sight, must be mingled with feelings of kindness and good will to the meanest of his creatures.

SUPPLEMENT TO BOOK III.

TABLES.

(1) THE following tables exhibit the population of England, Wales, and of the United States, respectively; each calculated on a radix of 20,000, and divided into sexes and ages, according to the last censuses. The proportions thus obtained are again distributed into annual numbers, and with as great a regularity in the decrements as possible, consistently with the amount actually found in every separate division of the censuses, which is rigidly adhered to throughout. It is plain that this method does not admit of any partial distribution, or interpolation of the numbers thus consecutively given, so as to answer any particular purpose; and it is equally so, that though absolute accuracy is wholly unattainable by any process whatever, yet that the method pursued is liable to no error that can materially affect any calculations or illustrations which are founded upon tables thus constructed.

(2) In nearly all former tables of this description, including those of Mr. Rickman, to whose labours the country stands deeply indebted, a radix of 10,000 has been made the basis of the calculation for each sex separately. But as the numbers of each are in no country equal, it is evident that a comparison of their proportion at any particular age, founded on a calculation assuming that equality, must be erroneous. I was led to this deviation from the previous mode, by

observing that in the table given in the fifteenth page of the preliminary observations to the last population abstracts, the proportion of males between the ages of forty and fifty, and again, between fifty and sixty, is greater than that of the females of the corresponding ages; whereas, on turning to the general abstract of the actual enumeration which occurs in the 429th page of the same volume, I found the contrary to be the case, and that in all the divisions, from the ages of fifteen and upwards, the females are invariably more numerous than the other sex.

(3) When therefore the usual method of calculation has been resorted to, no just comparison can be instituted between the proportionate number of the sexes at any given age, or, indeed, between their totals at all ages. And if the same comparison has to be extended to different countries, it will lead to still more erroneous conclusions; as for example, there are more females than males in the censuses of both England and Wales, whereas, in those of America, the reverse is the fact.

(4) With these observations the following tables are inserted; their impartiality is certain, from the impossibility of their being constructed otherwise; the uses to which they are applied will appear in different parts of this treatise.

TABLE XLVIII.

IN WHICH THE POPULATION OF ENGLAND, AS GIVEN IN THE CENSUS OF 1821, IS CALCULATED ON A RADIX OF 20,000, EXHIBITING THE PROPORTION OF BOTH SEXES, AND OF THE DIFFERENT AGES IN THAT NUMBER.

ENGLAND, Population in 1821, 11,261,437.

Ages.	Males.	Females.	Total.	Proportion to 20,000.		
				Males.	Females.	Total.
Under 5	739,762	725,202	1,464,964	1505	1475	2980
5 to 10	645,735	636,604	1,282,339	1314	1295	2609
10 to 15	562,209	530,226	1,092,435	1144	1079	2223
15 to 20	475,052	499,638	974,690	967	1017	1984
20 to 30	706,757	845,469	1,552,226	1438	1720	3158
30 to 40	555,713	607,867	1,163,580	1130	1236	2366
40 to 50	452,514	468,336	920,850	921	953	1874
50 to 60	320,092	328,077	648,169	651	668	1319
60 to 70	215,263	230,009	445,272	438	468	906
70 to 80	106,697	114,572	221,269	217	233	450
80 to 90	27,052	32,564	59,616	55	66	121
90 to 100	2,052	2,999	5,051	4	6	10
	4,808,898	5,021,563	9,830,461	9784	10,216	20,000

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
0	315	309	624	5	279	274	553
1	308	302	610	6	271	268	539
2	301	295	596	7	262	260	522
3	294	288	582	8	254	252	506
4	287	281	558	9	248	241	489
	1505	1475	2980		1314	1295	2609

Ages.	Males.	Females.	Total.
10	242	229	471
11	235	217	452
12	229	213	442
13	222	211	433
14	215	209	424
	1144	1079	2223
15	207	207	414
16	200	206	406
17	193	204	397
18	187	202	389
19	180	198	378
	967	1017	1984
20	173	194	367
21	166	189	355
22	158	184	342
23	150	179	329
24	143	174	317
25	137	170	307
26	132	165	297
27	129	160	289
28	126	155	281
29	124	150	274
	1438	1720	3158
30	122	145	267
31	120	139	259
32	118	133	251
33	116	128	244
34	114	123	237
35	112	119	231
36	110	116	226
37	108	113	221
38	106	111	217
39	104	109	213
	1130	1236	2366
40	102	107	209
41	100	105	205
42	98	103	201
43	96	101	196
44	94	97	191
45	91	94	185
46	89	91	180
47	86	88	174
48	84	85	169
49	81	82	163
	921	953	1874
50	78	78	156
51	74	75	149
52	71	73	144
53	68	70	138
54	65	67	132
55	63	65	128
56	61	63	124
57	59	61	120
58	57	59	116
59	55	57	112
	651	668	1319

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
60	53	55	108	80	10	12	22
61	51	53	104	81	9	10	19
62	49	52	101	82	8	9	17
63	47	50	97	83	7	8	15
64	45	48	93	84	6	7	13
65	43	46	89	85	5	6	11
66	41	44	85	86	4	5	9
67	39	42	81	87	3	4	7
68	36	40	76	88	2	3	5
69	34	38	72	89	1	2	3
	438	468	906		55	66	121
70	31	35	66	90	1	1	2
71	29	32	61	91	.	1	1
72	27	29	56	92	1	.	1
73	25	26	51	93	.	1	1
74	23	24	47	94	.	1	1
75	21	22	43	95	1	.	1
76	19	20	39	96	.	1	1
77	16	17	33	97	1	.	1
78	14	15	29	98	.	1	1
79	12	13	25	99	.	.	.
	217	233	450		4	6	10

Note.—" The total number of persons in England was 11,261,437, and the number of persons whose ages were returned, was 9,830,461, whence it appears that the ages of one-eighth part of the persons therein enumerated have not been obtained in compliance with a question to that effect."—Preliminary Observations to the Population Abstract of 1821, p. 14. " The result sought, it was obvious, would be attained with a sufficient degree of certainty, without enforcing the inquiry upon the entire population."—Ibid. It is unnecessary to add, that the prop of the sexes, and of their ages, respecti ly obtained on the 9,830,461, must be, f all practical purposes, as satisfactory though the same facts regarding remainder had been also ascertain and the present inquiry being confin almost entirely to comparative result cannot be in the least affected by th omission. The same observations a equally applicable to the ensuing tab regarding Wales.

TABLE XLIX.

IN WHICH THE POPULATION OF WALES, AS GIVEN IN THE CENSUS OF 1821, IS CALCULATED ON A RADIX OF 20,000, EXHIBITING THE PROPORTION OF BOTH SEXES AND OF THE DIFFERENT AGES IN THAT NUMBER.

WALES.—Population in 1821, 717,438.

Ages.	Males.	Females.	Total.	Proportion to every 20,000. Males.	Females.	Total.
Under 5	51,817	49,487	101,304	1480	1413	2893
5 to 10	48,123	45,853	93,976	1375	1310	2685
10 to 15	41,404	39,140	80,544	1182	1118	2300
15 to 20	34,534	35,931	70,465	987	1026	2013
20 to 30	49,023	55,869	104,892	1400	1596	2996
30 to 40	37,949	41,640	79,589	1084	1189	2273
40 to 50	29,815	32,641	62,456	852	932	1784
50 to 60	22,112	24,083	46,195	632	688	1820
60 to 70	16,246	19,175	35,421	464	548	1012
70 to 80	8,335	10,076	18,411	238	288	526
80 to 90	2,535	3,751	6,286	72	107	179
90 to 100	261	410	671	7	12	19
	342,154	358,056	700,210	9773	10227	20000

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
0	305	293	598	5	285	271	556
1	300	287	587	6	281	269	550
2	295	282	577	7	276	267	543
3	292	277	569	8	270	257	527
4	288	274	562	9	263	246	509
	1480	1413	2893		1375	1310	2685

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
10	254	236	490	35	107	115	222
11	245	227	472	36	105	112	217
12	236	222	458	37	103	110	213
13	227	218	445	38	101	108	209
14	220	215	435	39	98	106	204
	1182	1118	2300		1084	1189	2273
15	213	212	425	40	95	104	199
16	205	209	414	41	93	102	195
17	197	206	403	42	91	100	191
18	190	203	393	43	89	98	187
19	182	196	378	44	86	95	181
	987	1026	2013	45	84	92	176
20	173	188	361	46	82	89	171
21	164	180	344	47	80	86	166
22	155	172	327	48	77	84	161
23	146	164	310	49	75	82	157
24	138	156	294		852	932	1784
25	132	153	285	50	72	79	151
26	126	150	276	51	69	76	145
27	124	147	267	52	67	74	141
28	122	145	267	53	66	72	138
29	120	141	261	54	64	69	133
	1400	1596	2996	55	62	67	129
30	118	137	255	56	60	65	125
31	116	132	248	57	59	63	122
32	114	126	240	58	57	62	119
33	112	122	234	59	56	61	117
34	109	119	228		632	688	1320

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
60	55	60	115	80	13	16	29
61	53	59	112	81	12	15	27
62	52	58	110	82	11	14	25
63	50	57	107	83	9	13	22
64	48	56	104	84	7	12	19
65	46	55	101	85	6	11	17
66	43	54	97	86	5	9	14
67	41	52	93	87	4	7	11
68	39	50	89	88	3	6	9
69	37	47	84	89	2	4	6
	464	548	1012		72	107	179
70	35	44	79	90	1	3	4
71	32	40	72	91	1	2	3
72	29	36	65	92	1	2	3
73	27	33	60	93	1	1	2
74	25	29	54	94	1	1	2
75	22	26	48	95	.	1	1
76	20	23	43	96	1	.	1
77	18	21	39	97	.	1	1
78	16	19	35	98	1	.	1
79	14	17	31	99	.	1	1
	238	288	526		7	12	19

Note.—" The total number of persons in Wales was 717,438, and the " number of persons whose ages were " returned was 700,210; whence, it appears, that the ages of one in forty-one " of the persons therein enumerated " have not been obtained."—Population Abstracts for 1821, p. 487. The remarks made at the termination of the preceding table are equally applicable to the calculation given in this.

TABLE L.

IN WHICH THE POPULATION OF OTHER PARTS OF THE UNITED KINGDOM, AS GIVEN IN THE CENSUS OF 1821, IS CALCULATED ON A RADIX OF 20,000: EXHIBITING THE PROPORTIONS OF BOTH SEXES, AND OF THE DIFFERENT AGES IN THAT NUMBER.

	Ireland.*	Connaught*	LANCASHIRE.					
			Hundred of Salford.			Hundred North of the Sands.		
Ages.	Total.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
Under 5	3064	3228	1684	1651	3335	1480	1479	2959
5 to 10	2711	2838	1382	1346	2728	1432	1258	2690
10 to 15	2437	2437	1270	1225	2495	1164	1041	2205
15 to 20	2439	2500	1057	1105	2162	1009	943	1952
20 to 30	3520	3422	1508	1754	3262	1430	1530	2960
30 to 40	2298	2299	1133	1217	2350	1154	1204	2358
40 to 50	1544	1441	846	838	1684	836	893	1729
50 to 60	1202	1187	536	508	1044	624	704	1328
60 to 70	546	457	309	304	613	505	570	1075
70 to 80	191	154	127	137	264	256	295	551
80 to 90	41	30	33	26	59	70	103	173
90 to 100	7	7	2	2	4	5	15	20
	20000	20000	9887	10113	20000	9965	10035	20000

* In the Irish Census the Sexes are not discriminated.

TABLE LI.

IN WHICH THE POPULATION OF THE UNITED STATES, AS GIVEN IN THE CENSUS OF 1821, IS CALCULATED ON A RADIX OF 20,000, EXHIBITING THE PROPORTIONS EXISTING OF BOTH SEXES, AND OF EVERY AGE, IN THAT NUMBER.

: UNITED STATES. White Population in 1821, 7,861,710.

Ages.	Males.	Females.	Total.	Proportion to every 20,000.		
				Males.	Females.	Total.
Under 10	1,345,220	1,280,559	2,625,770	3422	3257	6679
10 to 16	612,535	605,348	2,217,883	1558	1539	3097
16 to 18	182,205	.. ..	.. ..	463	..	..
18 to 26	776,150	781,371	1;557,521	1975	1988	3963
26 to 45	776,083	726,600	1,502,683	1951	1874	3825
45 and upwards.	495,065	462,788	957,853	1259	1177	2436
Total.	3,995,053	3,866,657	7,861,710	10,165	9835	20,000

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
0	395	373	768	10	282	275	557
1	382	361	743	11	272	267	539
2	370	350	720	12	262	259	521
3	358	339	697	13	254	252	506
4	347	329	676	14	247	246	493
5	336	319	655	15	241	240	481
6	325	310	635		1558	1539	3097
7	314	301	615				
8	303	292	595	16	235	..	..
9	292	283	575	17	228	..	..
	3422	3257	6679		463	..	..

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
16	235	234	469	45	75	69	144
17	228	228	456	46	73	67	140
18	220	221	441	47	71	65	136
19	212	214	426	48	69	63	132
20	204	206	410	49	67	62	129
21	195	197	392	50	65	61	126
22	186	187	373	51	63	60	123
23	176	177	353	52	61	59	120
24	165	167	332	53	59	58	117
25	154	157	311	54	57	56	113
	1975	1988	3963	55	54	54	108
26	145	147	292	56	51	51	102
27	137	138	275	57	48	48	96
28	130	130	260	58	45	45	90
29	123	122	245	59	42	42	84
30	118	115	233	60	39	38	77
31	114	109	223	61	36	34	70
32	110	105	215	62	33	30	63
33	106	101	207	63	30	26	56
34	102	97	199	64	27	23	50
35	98	93	191	65	24	20	44
36	95	90	185	66	21	17	38
37	92	87	179	67	18	15	33
38	89	84	173	68	15	13	28
39	87	81	168	69	13	11	24
40	85	79	164	70	11	10	21
41	83	77	160	71	10	9	19
42	81	75	156	72	9	8	17
43	79	73	152	73	8	7	15
44	77	71	148	74	7	7	14
	1951	1874	3625	75	7	6	13

TABLE LI.

IN WHICH THE POPULATION OF THE UNITED STATES, AS GIVEN IN THE CENSUS OF 1821, IS CALCULATED ON A RADIX OF 20,000, EXHIBITING THE PROPORTIONS EXISTING OF BOTH SEXES, AND OF EVERY AGE, IN THAT NUMBER.

UNITED STATES. White Population in 1821, 7,861,710.

Ages.	Males.	Females.	Total.	Proportion to every 20,000. Males.	Females.	Total.
Under 10	1,345,220	1,280,559	2,625,770	3422	3257	6679
10 to 16	612,535	605,348	2,217,883	1558	1539	3097
16 to 18	182,205	.. ..	.. ..	463	..	..
18 to 26	776,150	781,371	1,557,521	1975	1988	3963
26 to 45	776,083	736,600	1,502,683	1951	1874	3825
45 and upwards.	495,065	462,788	957,853	1259	1177	2436
Total.	3,995,053	3,866,657	7,861,710	10,165	9835	20,000

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
0	395	373	768	10	282	275	557
1	382	361	743	11	272	267	539
2	370	350	720	12	262	259	521
3	358	339	697	13	254	252	506
4	347	329	676	14	247	246	493
5	336	319	655	15	241	240	481
6	325	310	635		1558	1539	3097
7	314	301	615				
8	303	292	595				
9	292	283	575	16	235	..	..
				17	228	..	..
	3422	3257	6679		463	..	..

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
16	235	234	469	45	75	69	144
17	228	228	456	46	73	67	140
18	220	221	441	47	71	65	136
19	212	214	426	48	69	63	132
20	204	206	410	49	67	62	129
21	195	197	392	50	65	61	126
22	186	187	373	51	63	60	123
23	176	177	353	52	61	59	120
24	165	167	332	53	59	58	117
25	154	157	311	54	57	56	113
	1975	1988	3963	55	54	54	108
26	145	147	292	56	51	51	102
27	137	138	275	57	48	48	96
28	130	130	260	58	45	45	90
29	123	122	245	59	42	42	84
30	118	115	233	60	39	38	77
31	114	109	223	61	36	34	70
32	110	105	215	62	33	30	63
33	106	101	207	63	30	26	56
34	102	97	199	64	27	23	50
35	98	93	191	65	24	20	44
36	95	90	185	66	21	17	38
37	92	87	179	67	18	15	33
38	89	84	173	68	15	13	28
39	87	81	168	69	13	11	24
40	85	79	164	70	11	10	21
41	83	77	160	71	10	9	19
42	81	75	156	72	9	8	17
43	79	73	152	73	8	7	15
44	77	71	148	74	7	7	14
	1951	1874	3625	75	7	6	13

Ages.	Males.	Females.	Total.	Ages.	Males.	Females.	Total.
76	6	6	12	89	1	1	2
77	6	5	11	90	..	1	1
78	5	5	10	91	1	..	1
79	5	4	9	92	..	1	1
80	4	4	8	93	1	..	1
81	4	3	7	94	..	1	1
82	3	3	6	95	1	..	1
83	3	2	5	96	..	1	1
84	2	2	4	97	1	..	1
85	2	1	3	98	..	..	..
86	2	1	3	99	1	..	1
87	2	1	3				
88	1	1	2		1259	1177	2436

TABLE LII.

IN WHICH THE FREE COLOURED POPULATION OF THE UNITED STATES IS CALCULATED ON A RADIX OF 20,000, ACCORDING TO THE CENSUS OF 1821.

Total, 233,530.						
Ages.	Males.	Females.	Total.	Proportion to 20,000.		
				Males.	Females.	Total.
Under 14	47,659	45,898	93,557	4082	3931	8013
14 to 26	24,048	28,800	52,848	2060	2466	4526
26 to 45	23,450	27,181	50,631	2008	2328	4336
45 and upwards.	17,613	18,881	36,494	1508	1617	3125
	112,770	120,760	233,530	9658	10,342	20,000

BOOK IV.

OF THE LAW OF POPULATION: ITS PRINCIPLE STATED AND PROVED.

CHAPTER I.

INTRODUCTORY.

(1) Having, in the preceding Books of this Treatise, considered at large the theory which professes to have discovered a supposed tendency in the human race, and indeed throughout all animated life, to a constant and excessive increase beyond their means of sustentation, which has to be repressed by cruel inflictions or unnatural restraints; and having shewn that such an hypothesis is not only irreconcileable with every received notion of the wisdom and benevolence of the Deity, and the whole course of human experience, but is totally refuted even by the facts brought forward in its support; it now remains that the true law of population, a law of a directly contrary kind, both as to its nature and its effects, and which it is the main purpose of this work to establish, should be unfolded, and the proofs on which it rests submitted to particular and direct consideration. And this is the more necessary, as being a principle perfectly distinct from the various suppositions which have been hitherto advanced on the subject, and substantiated, it is hoped, in a dissimilar manner, it will, undoubtedly, have to encounter that distrust and opposition with which, happily for the cause of truth, all original propositions are invariably received.

(2) But, however confident I may be as to the result of the ensuing part of the argument, and I feel abundantly so, I will nevertheless, on its very

threshold, pause to make this protestation. If, in my attempt to deduce, from a great number and variety of facts, the uniform law of Nature about to be developed, namely, that of a regulation of the existing numbers of mankind, in reference to their means of subsistence, and operating on a principle of benevolence, it should be supposed by some, that I have, partly or wholly, erred in stating the proposition, or failed in fully demonstrating it, let not such conclude thence that the contrary theory is re-established; let them still remember that the whole of the argument which has been pursued through the preceding part of this work remains untouched. If my numerical proofs should not be deemed conclusive, that circumstance will not confer either truth or possibility on the calculations upon which the contrary theory professes to be erected, and which has been shewn to be void of both; still less will it affect that historical demonstration which every age and country of the world add to the truth of the more cheering system, as will be fully evidenced in a subsequent part of this work. Those effects which must ultimately decide the dispute, however conducted, are not to be questioned merely from a persevering opinion that their causes are still left obscure. Hence, whatever may be thought ot the succeeding reasonings, in spite of the computations of the modern theorists, the voice of reason, of Nature, and of truth is heard echoing that of Revelation; " Increase and multiply." And of the principle of that increase, now audaciously declared to be an " EVIL," be it whatever it may, experience, the test of all things, still continues to repeat, and shall repeat to the end of time what the Deity proclaimed concerning it at its commencement,—BEHOLD, IT IS VERY GOOD.

(3) But I am aware that the last allusion will give no weight to the appeal with some of the pretended philosophers of the present day. We live in "a generation which seeketh after a sign," and supposing "no sign should be given," but that which the volume of creation exhibits, is not that abundantly sufficient to prove two things decisive of the question; first, that the Deity wills the happiness of his offspring; second, that he has the power of accomplishing it? The repast of the meanest insect for which he spreads his table in the wilderness, involves a system of adaptations, and a complication of secondary causes, which, in every instance, rise into miracles, and require for their accomplishment the agency of the surrounding universe. How then dare we to conceive that he to whom all the inferior orders of creation, however perfect and happy in themselves, are plainly subservient; who was called into existence as the last and best work of the Creator, crowned by him with honour, and invested with immortality, should alone be left inadequately provided for by the Parent of the universe?

(4) A doubt, so derogatory to God, and so humiliating to man, has rarely been expressed till the present era, when it has been suddenly embraced and even converted into a regular system. On the contrary, it has been hitherto the most pleasing pursuit of true philosophy to trace the means by which Nature is perpetually providing for her innumerable offspring. Respecting man, in particular, it has been triumphantly shewn, that his numerical increase has been still accompanied by a far more than corresponding augmentation in the measure, and improvement in the means, of his subsistence: that, in this career, his moral and intellectual has far outstripped his

physical progress; while the face of nature has brightened with increasing beauty, and the climates themselves have softened their rigours wherever he has advanced his domain. Philanthropy has still pointed onward to a period when its triumphs would be yet further extended; when civilized man should be no longer confined to the narrow space he now possesses, but should spread more widely over the habitable globe, and plant its vast and solitary deserts with prosperous nations. Meantime, no unworthy dread was felt, that the bounties of creation, whether of earth or ocean, would at length fail to reward human industry with abundance. Past experience dictated future hopes in favour of human beings, which were felt securely placed in Him who had been their "dwelling-place throughout all generations." No limits were therefore impiously prescribed to his power or goodness; and, in the eye of divine philosophy, these, his essential attributes, have been constantly recognized in active operation, not only in supplying the present, but in anticipating the future, necessities of mankind; supplementing, as it were, the work of creation, in order to enlarge the bounds of their habitation. Such have been the interpretations, elevated, though perhaps enthusiastic, which have been put upon many of the visible operations of Nature; as, for instance, the gradual reclamation of immense wastes and morasses, the exsiccation of inland seas, the dereliction of the waves of the ocean from accumulating shores; the emergence of islands, lifted from the bosom of the deep by the irresistible agency of those secondary causes which He created, and still controls; or the unceasing erection, amidst its deepest and remotest waves, by the masonry of unimaginable myriads of minute beings, of those rocky pillars, destined to become the foundation of future continents, glowing with vegetation, and replenished with existence: these, I say, and a thousand other pleasing speculations, have been indulged on this important subject; of the wildest and most enthusiastic of which it may be averred, with the utmost truth and soberness, that it involves an infinitely less miracle, than that the scheme in which the Deity contemplated the manifestation of his goodness, and of "his wonderful works unto the children of men," should become that in which his insufficiency and their misery should be finally manifested.

(5) Another view of the principle of population, distinct from any of the preceding ones, had frequently presented itself to my mind previously to my having given the subject that degree of consideration which I have since devoted to it; and perhaps, it may be still, not improperly, mentioned. It is this: admitting, that amongst some of the more civilized nations, including particularly our own, we were to allow that human prolificness and longevity had so enlarged, that were their proportions universally extended, the increase of mankind would ultimately exceed that of their means of subsistence: what then? Are those proportions thus universally extended? They are not. Would they be so, were the regions where it is otherwise, namely, the greatest part of the habitable globe, differently circumstanced, in regard to their political condition? We have not the least proof to advance in favour of such a supposition. There are many to confront it. Immense countries, once the most populous, and still the fairest regions, upon the face of the earth, have long been doomed to comparative solitude and desolation, with no discernible reasons for so portentous a change, save such as lie without the

province of geometry or political economy, but which have been accurately described by a sacred bard of antiquity[1]; and which it is to be feared may possibly be as applicable to future generations of human beings as they have proved to be regarding the past.

(6) But, without touching on the moral causes of this decay in certain of the families of mankind, the fact is strikingly obvious, and a reference to it strictly within the limits of the present subject: Malte-Brun observes, that it is the most ancient races which are the least numerous: "thus," says he, "in the forest, "the oldest trees perish, while the younger extend afar "their wide spreading branches[2]." Nor is this idea without historical confirmation. The very cradle of mankind, and their earliest seat, the East, has become their tomb; where the few and wretched survivors seem but like a band of lingering mourners. Ages have rolled away since their race was "minished from among the children of men;" and nothing seems capable of reviving their lost energies, or of replenishing their ineffectual numbers. Generations afterward, the still more crowded and august centre of the human family was fixed nearer to our shores, but its glories also have long since fled; and, surrounded by mouldering remains of past greatness, Rome sits as a widow, amidst her sickly and diminished race, mourning over her apparently irretrievable desolation and decay. The confluent wealth and numbers of the surrounding nations have been insufficient in a succession of ages to restore the wasted inhabitants of Italy; and the other southern peninsula of Europe experiences a like melancholy fate. Meantime, the tide of population has pushed forward in the same direction, and the north-western part of the old world feels, at length, its freshening influence.

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[1] David, Ps. cvii. 34, &c.

[2] Malte-Brun, Géog., l. xcv., p. 72.

Whenever that tide has hitherto ebbed, it has left a stagnant and degraded state of society; wherever it has flowed, it has borne along with it power, and greatness and opulence, and has elevated man to increasing degrees of moral and intellectual superiority. Nor have these advantages been confined within its own bounds: it has overflowed them, and as from a mighty reservoir, refreshed the distant earth with that moral irrigation, if I may so speak, which, wherever it spreads, covers it with life and beauty. The restless flood may still, as has been prognosticated, roll onwards, and, for aught we know to the contrary, nations that we have planted, may at length, and in their turn, arise the superiors and instructors of the universe! when our vast population, our extended dominion, and our unrivalled glory may survive only in the glowing pages of history. If so, may we crowd the term of our career with deeds which shall echo to eternity! Meantime, suppose the Supreme Governor of the universe have thus seen good to ordain similar cycles in the vital, as he has in the physical, world, and for similar purposes, namely, in order successively to distribute his varied benefits with a more equal hand, and to preserve the whole from stagnation and corruption, what have the anti-populationists to object to such an ordination? The idea is neither unphilosophical in itself, nor irreconcileable with the records of creation. In the mean while, however, they have calculated upon a few imperfect and uncertain data, collected partially, and within a short and insignificant period of time, that the increase of human beings in relation to that of their food is in excess; and they transfer the ignorant, but daring deduction to the universal operations of the Deity in all countries, whether as it respects the time present, of which they know little, or the past, of which they know less, or the future, of which they know nothing. Can any thing equal the presumption of a human being who thus argues touching the Divine government? Yes; that which is its apology, his ignorance. An insect of a day, on the narrow shore of time, mounted on a grain of sand, calculating, from the tide of life flowing towards it, an universal deluge, and calling upon its fellow insects to stem the restless flood!—ignorant of the regulated impulse every wave obeys, and with organs infinitely too minute to perceive the eternal hills by which it is bounded, or to hear that voice which proclaims, "Hitherto shalt thou go and no further,"—the voice of Him who is the fountain of that ocean of immortality, and who measureth its waters in the hollow of his hand!

(7) But a still more important reason than all these why the theory of population, which I am controverting, ought never to have been received, at least in a Christian country, is that founded on divine Revelation, which, indeed, when adequately understood and fully embraced, renders all other arguments against that theory unnecessary. The doctrines and duties it inculcates, and the views it presents of futurity, are wholly irreconcileable with any such system, however modified and explained. The fact of a world so many thousand years old, and yet not a tenth part peopled, coupled with the assertion, that if population be not checked its inhabitants will assuredly become unsustainable in numbers, assumes, as a *petitio principii*, the certainty of that which Revelation has pronounced, as it respects all human knowledge, uncertain; the duration of the world As a mere supposition even, it insults, but put forth as a demonstration it contradicts, Christianity. The tendency also to undue increase, as

maintained by the same theory, and the misery it must occasion to the human race, are also plainly at variance with the very letter, as well as with the spirit, of the sacred records; those concluding scenes of time, when

> ——— the great globe itself,
> And all which it inherit, shall dissolve,

far different to what the theory in question predicts, are adumbrated to us as those of enjoyment and affluence, and that not by means of the prevalence of the preventive check, but when mankind shall be "marrying and giving in marriage." Such, at least, are the declarations of the Author of Christianity; but I shall proceed to discuss the subject on other than religious grounds, though it requires a considerable mental effort to regard it in any other light: indeed, no human ingenuity can prevent its ultimately resolving itself into a question which touches the attributes of the Creator and Governor of the world. There are some, however, who are prejudiced by such appeals, who, as Lord Hale observes, "pretend to much severity of wit, and would "be thought too wise to be imposed upon by credu- "lity, where they think they have not evidence "enough of sense or reason to convince them; who, "in order to be thought men above the common rate, "have gone about as far as they durst to exclude "God out of the world, pitying those men as troubled "with credulity and of weak parts, that believe in the "regiment of divine providence[1]." To the confusion of these, the argument will henceforth be pursued in another direction. A principle of population will be now enunciated, perfectly different to the one opposed, and entirely distinct from, though not contradictory of, many of the preceding suppositions: a law of Nature capable of effecting all the purposes which the one controverted could accomplish, without threatening any of the evils which it enunciates; perfectly confirmatory of the principles of divine benevolence, as manifested in the government of the world, and agreeable to the analogies of nature throughout; and which, in fine, reconciles the true theory of human increase with the affections, duties, and interests of mankind. If this principle should be established, it will add another proof to the many which have been already accumulated, that it is the duty of human beings to confide in the Divine goodness, even where they cannot discern its operation; and that the religion of revelation, however it may oppose the selfish views, the changeful notions, or the shortsighted policy of the hour, is, when duly examined and adequately comprehended, the religion of philosophy, of Nature, and of truth. The promulgation of this principle is reserved for an ensuing chapter, and the proofs on which it is founded will occupy the entire Book.

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[1] Hale, Origination of Mankind, p. 27.

CHAPTER II.

OF THE LAW OF POPULATION: ANTICIPATORY COMPUTATIONS OF NATURE IN REFERENCE THERETO.

(1) It is a striking fact that man, notwithstanding the prevailing dread of his undue increase, is one of the most sterile beings in creation. The means by which, on the one hand, his race is perpetuated, and, on the other, protected from the calamitous consequences of a really redundant increase, involving a series of preliminary calculations of the most exact and certain nature, are amongst the first considerations which this most important subject suggests to the human mind.

(2) It is asserted, but it has been already shewn how inaccurately, that in one favoured portion of the world, mankind annually increase in number after the rate of three individuals upon every hundred of the existing population. Supposing, however, this ratio of increase actually to exist any where, the difference between the number of the births causing it, and of those in a stationary, or even retrogressive population, is, when calculated on each marriage, so minute, as to manifest at once the utter hopelessness and glaring absurdity of attempting to interfere, by laws or otherwise, with the course of Nature. When the strength of the principle sought to be regulated or repressed, which is all but irresistible, is considered; it must be instantly plain to any one, that so to interfere with it as to produce any effect whatever, means must be resorted to which must operate upon the mass;

and, in so doing, they would effectuate the destruction of the species. For instance, how would those who have the folly to suppose that population in this country advances too fast by one per cent., so operate, had they even their wish, as to diminish the number of marriages by one in one hundred, or otherwise contract the fecundity of the existing number by about one twenty-fifth part of a birth each, or calculate, upon their own erroneous suppositions, the term of that postponement of marriage on which they insist so much, so as to produce this exact effect? The very idea is, in each instance, absurd to the last degree. If the computations of the Author of Nature are, as some suppose, incorrect, the condition of humanity is hopeless: it is out of the power of human beings to rectify them.

(3) But there is no call for human interference. Slight as is the increase of population under the most favourable circumstances, that increase is a matter of the strictest regulation. Causes apparently unconnected, varying exceedingly when individually considered, are nevertheless so governed and complicated as to produce results surprisingly accurate and infallibly certain. And, moreover, these physical causes identify themselves with moral ones, which, when duly considered, are found as essential to the happiness as to the preservation of the species. How, then, can be doubted but that these physical principles, to which the moral laws of our being evince the most striking adaptations, and which are enforced by the natural duties of mankind, are as perfect in their operation as they are benevolent in their design? I proceed to demonstrate this cheering and important truth in the remaining part of this treatise. Previously, however, to entering upon the main branch of the sub-

ject, I shall point out a series of facts by no means unconnected with it, some of which, it is believed, have been hitherto unnoticed; forming in the whole a system of preliminary calculations, as I venture to term them, on the part of Nature, in reference to its great design of reproduction, which will, it is hoped, fully prepare the mind of the reader for the reception of that great law of population about to be developed.

(4) And first, the reproduction of the human species, in common with all other animated beings, by means of the sexual system, which lies at the very foundation of all the succeeding arguments, is of itself, when rightly considered, a stupendous proof of that wisdom and benevolence which governs the entire principle of population; but I shall refrain from expressing the ideas that present themselves to my mind on this important point, and proceed to remark upon the interesting fact of the nearly equal division of these sexes.

(5) Marriage, or the permanent union of one man with one woman, is an institution not of religion merely, but of Nature; and essential to the preservation of the human race. Regarding mankind, the attention due to the mother during gestation, and after parturition; the protracted period of infancy, during which the offspring demands the attention of both parents, and derives a greater security of life from the circumstance of having more than one; the physical and mental tuition necessary in the earlier stages of existence;—these, and a variety of other important circumstances essential to the continuation of the species, comprehended in that emphatic word of our Saxon ancestors, "rearing," are secured by this institution; and this again is dictated by that individuality of affection which is a natural attribute of the

human race, as well as of such other of the animated tribes of nature amongst which it appears also necessary, and it continues as long as it remains so. Without this feeling, the sexual propensity, however powerful, would fail in accomplishing the purpose under consideration: "illicit connexions," as Montesquieu has observed, "contributing but little to the propagation of the species[1];" he might have added, still less to its preservation. To the sexual propensity, therefore, is added another perfectly distinct from it, though, in a state of purity, always accompanying it, namely, affection, or love: the union of these feelings leads to that mutual appropriation called marriage, which is eagerly sought and vindictively protected, and exists in some form or other, more or less perfect, in every human community upon earth. Hence the race of man is preserved.

(6) Now it has been already shewn, in a preceding part of this work, that the state of marriage is, amongst the adults of all civilized communities, almost universal; and, nevertheless, the increase in none of them gives more than a very small annual accession of numbers. It follows, therefore, that, were any natural obstacles interposed against the almost universal prevalence of marriage, as now instituted, population must rapidly retrograde. Of all such obstacles, an inequality in the numbers of the sexes would be the most insurmountable; would introduce inconceivable confusion and distress, and uproot the whole social system. Against so fatal a catastrophe Nature has protected mankind by one of the most certain, yet inscrutable of her laws, which, in providing for the universality, apparently dictates the duty, of the marriage union.

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[1] Montesquieu, l'Esprit des Loix, l. xxiii., c. 2, t. ii., p. 130.

(7) In proving, therefore, that the whole system of population is under the unceasing direction of the Deity, either through the operation of those secondary causes resulting from his eternal prescience, or from his perpetually superintending providence, it is natural that this near equality in the numbers of the sexes at birth should have the first consideration. The fact is undoubted; but when the elements forming the general results are considered, consisting, as they do, of individual and unconnected families, in which the sexes are presented in all the possible disproportions of which the numbers involved are susceptible, and sometimes in differences, literally speaking, infinite[1]; that these extreme contrarieties should at all times, and in every community, be so balanced as to form the computation now under notice, is one of the most astonishing of those standing miracles to which constant experience could alone familiarise our minds, and gain our belief.

(8) The proportion in question has exercised the calculating powers of some of the ablest mathematicians, from Dr. Arbuthnot[2] down to La Place[3]. It is no part of my object to shew from them what I conceive few will dispute, that it is absurd to attribute to the doctrine of chances, as it is called, such a result. I will, therefore, content myself with merely giving to the reader a calculation of Professor 'Sgravesande, as inserted by Dr. Nieuwentit, who, in observing upon the proportion of the sexes born in London only, and during a period not exceeding eighty-two years, says, that "if we multiply a number of a hundred thou-"sand times a hundred thousand millions, first with "a hundred thousand times a hundred millions, we

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[1] As when there are males and no females, or vice versâ.

[2] Philosophical Transactions, vol. v., p. 606.

[3] La Place, Doctrine of Probabilities.

" must take ten millions of this prodigious number
" above seventy-five thousand five hundred and
" eighty times, before we can come at the number or
" odds against one, that what happened in London
" in the aforesaid eighty-two years, would not have
" so happened, if the births of the males and females
" were the result of mere chance only[1]." It is true these proportions are expressed in language only, and are so immense that it is utterly impossible the human mind, by its utmost efforts, can have the least conception of them: it is equally, though perhaps not so obviously true, of the entire subject before us: The principle of reproduction from the first dawn of creation to the consummation of all things, is beyond the reach of the imagination, certainly, of human, and, probably, of all finite beings.

(9) This nearly equal division of the sexes, we observe further, has been found to exist in all communities where the information necessary to establish the fact has been obtained. The supposition of certain travellers to the contrary, founded, doubtless, upon the most uncertain of all proofs, mere incidental and personal observation, is now known to be incorrect. That a similar equality has also existed in all ages, and from the remotest times, we cannot doubt. We have an incidental corroboration of this fact, more curious indeed than necessary to the argument, handed down to us in a legend of early antiquity. It is said that, in a contest between the men and women at the naming of the city of Athens, whether it should be called after Neptune or Athena, the women carried it, but by a majority of one vote only.

(10) The importance of this regulation of Nature will be, at least, as apparent as its exactness, if we

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[1] Dr. Nieuwentit, Religious Philosopher, vol. iii., p. 363.

consider the effects it has necessarily to produce; which may be best understood, if we imagine, for a moment, the consequences of its absence. The physical constitution of human beings remaining the same as at present, it must be evident that such a change in the laws of Nature as would disturb this equality of numbers, would either, on the one hand, produce that excess of males which would inevitably introduce promiscuous concubinage or polyandryism, and thereby not only destroy the moral feelings, but extinguish the existence of the species; or, on the other, occasion a similar superproportion of females, which would therefore sanction and dictate polygamy, as a law of Nature and necessity; the certain effect of which (the fecundity of females remaining the same) would be, independently of its moral consequences, the multiplication of mankind into unsustainable numbers. Even any sensible variation from the regular proportion in which the sexes are born, or uncertainty in particular times and places in this respect, would threaten both these evils alternately, and introduce inexpressible confusion into the community, of which such a state of things would be the ultimate destruction. In every point of view, therefore, any deviation from this fundamental law of Nature would be fatal to the species.

(11) But the division of the sexes at birth is not equal; nor is the difference in their numbers, certain as it may appear, stationary in different periods, or alike at the same time in various places. But, then, these variations are of such a nature, that, instead of weakening the force of the preceding argument in favour of the existence of those exact computations of Providence contended for, they heighten it into the utmost degree of moral certainty. Let us, however, in the first place, examine the proportion of the sexes

at birth in this country, and consider its adaptation to the great design of Nature, namely, a provision for the universality of marriage, with a view to the preservation and due increase of the species.

(12) According to the published Registers of England, there were born, in this division of the empire, from the years 1800 to 1820, 2,975,125 males, and 2,856,111 females[1], giving a proportion, very accurately, of 25 births of the former sex, to 24 of the latter. The question then arises, does this inequality doom 1 in 25 of the male sex to celibacy? On the contrary, it is such an anticipation of, and compensation for, other laws of Nature in constant operation, as evidently to provide for the ultimate union of the adults of both sexes. In every period of existence, even in utero, in the article of birth, in all the succeeding stages of life to its final close, the life of the male is more precarious than that of the female; and it is to compensate this greater degree of mortality, and not in anticipation of the murderous "correctives" of the supposed superfluous numbers of the male sex, as some writers, little in accordance with the benignity of Nature, explain it, that this wonderful provision is made. The consequence is, that about the period of puberty, the numbers of each sex become balanced, (a very interesting fact, which I had remarked long previously to seeing it observed elsewhere[2],) afterward the females constitute an increasing majority.

(13) But, to confine our observations on this head to the fruitful period of life: Dr. Seybert, in his work on American Statistics, observes, that at that age the females of the United States exceed in number the

[1] Population Abstracts, 1811 and 1821.

[2] Dr. Hooper, Medical Statistics, p. 221.

males; and he attributes the fact, most properly, to the wisdom of the Almighty in thus certainly providing for the preservation of the species[1]. But the truth is, that the excess to which he alludes is less in America than in any country with the population of which we are acquainted; and for this reason, the number of male emigrants who, in the prime of life, resort thither, obviously increase the superproportion of the female sex of their own age in those communities which they leave, and as plainly diminish it in that to which they resort. If, then, this excess of females exists in every country, it may again be asked, Does not this disproportion, at all events, necessarily consign a certain number of them, equal to that difference, to involuntary celibacy? I again answer, Certainly not; and, in justifying this reply, a still nearer view, it is hoped, will be taken of those exact adaptations by which Nature accomplishes her purpose, the preservation of the human race.

(14) One of the earliest and not least judicious writers on the subject of population, Major Graunt, in estimating the duration of the fecund period of human existence in males and females respectively, calculates that, in an equal number of each, the comparison will be as 560 to 325[2]: the term of fruitfulness in the male exceeding that in the female in that proportion, which, as it appears to me, he has still underrated[3]. Now, if the lives of the married pairs terminated together, or if marriage remained indissoluble even by the death of either of the parties contracting it, then the period of the prolificness of the male would, virtually, be limited to that of the female, and the difference in its natural duration, in the two sexes, would be a superfluous, if

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[1] Dr. Seybert, American Statistics, p. 25.

[2] Graunt, Observations, ch. viii., § 5, p. 44.

[3] Mayo, Outlines of Human Physiology, p. 462.

not a pernicious regulation; but the facts are altogether otherwise. The marriage contract, as an institution of Nature, is obviously dissolved by the death of either of the parties forming it: coincident with this, is the doctrine of divine revelation in relation to it; and both are as plainly demanded by the condition and necessity of human beings. We have already seen how important a part of the annual births is added by second and subsequent marriages; and that, of these after-marriages, there are nearly twice the number contracted by males who have been previously married, as by females similarly circumstanced; or, leaving out the aged as not affecting the question, more than thrice the number. Circumstances, these, which must be considered, before the exact computations of Nature, in order to realize them, are examined and manifested. Supposing that the period of prolificness in males is usually about twenty years longer than in females, it must be evident, when the deductions are made for the somewhat later marriages of the former, and likewise for their rather earlier average mortality, that, among the marriages dissolved by death, the female will have survived the period in question in a far greater number of cases than the male. The much greater number, therefore, of widowers who marry again, than of widows, is a circumstance not only founded on custom, but on the nature and necessities of society; it moreover seems sanctioned by the authority of revelation; and, it cannot be doubted, comports with the comparative feelings and condition of the parties themselves. These latter considerations, however, will not be further touched upon; it is sufficient to observe at present that, without this greater proportion of subsequent marriages amongst widowers still at a prolific age, than amongst widows at a similar period of life perhaps, but still no longer fruitful, the great purpose of Nature could not possibly be accomplished: — the race would dwindle, and become extinct.

(15) An observation of a general nature, as having a strict relation to the present point, will not, as it is conceived, be here misplaced. It is by means of that affection which often, I might almost have said always, conceals the grosser passion which it subserves, that Nature accomplishes her primary purpose; and this affection, it is important to remark, can only be excited by those appearances in the female sex which are indicative of fruitfulness; I mean, a certain degree of beauty, or at least, of youthfulness, independently of which the sexual passion towards the female cannot exist. If, therefore, it be necessary to supplement the births resulting from first marriages by the fruitfulness of second ones, it is equally clear that, with the exception of connexions of mere convenience between aged parties, these subsequent weddings must be principally formed with females at the youthful, and consequently fruitful, period of existence. Let us proceed to inquire, then, whether the computations of Nature indicate that she has contemplated and provided for this emergency also.

(16) Turning to Table XIX., in the Third Book, which was constructed without the remotest view to this branch of the argument, it there appears, that to 8100 marriages between parties which were previously unmarried, there were 1100 widowers married to women previously unmarried, and only 500 widows married to single men; the remaining 300 marriages between widowers and widows, balancing, as they do, each other, will not affect the present computation. Hence it appears, that to every 8600 males, married for the first time, there are 9200 females: a proportion, not

only conformable to the fact, but to the principles of Nature, as just explained. Let us turn, then, to the census of any country in which the ages and sexes of the population are discriminated, and which has not been materially disturbed by emigration, or thinned by wars, and examine whether Providence has anticipated and provided for results so essential to the accomplishment of its designs. Of the different countries furnishing the necessary information, on the points under consideration, Sweden seems to be that where the population, it is presumed, has been least influenced by the circumstances alluded to. Now assuming that, were there no checks to marriage but what Nature dictates, the marriages of the males would take place at 22 years, and those of the females at 19; then, turning to Dr. Price's table, where the population of that country is given, divided into the numbers of each sex at every age, calculated on a given radix; we find that there, for every 5483 males of 22 years old, there are 5852 females of 19[1], which, were all to marry for the first time at those ages, respectively, would precisely justify the calculations exhibited in Table XIX., just referred to, at least, within the almost unnoticeable difference of 21 females only in 9200. Nor because all do not marry at those or any other ages, is the calculation the less striking or necessary, the real impediments to that union, of whatever kind, being, it may be safely presumed, about equal in both sexes.

(17) I present these calculations to the reader, not as precisely certain and accurate results, but rather as illustrations of certain provisions of Nature which have been hitherto, in great measure, most strangely overlooked. I do not suspect, however, that, as approxi-

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[1] Dr. Price, Reversionary Payments, vol. ii., p. 150.

mations, they are very distant from the truth; and, as a gratifying proof of their general accuracy, I may add, that neither in the construction of my own table, nor in my reference to that of Dr. Price, relating to the population of Sweden, nor in fixing upon the ages specified, (which might, indeed, be advanced without injuring the proof,) did I use any, the least, management or selection whatsoever; and still the result could have hardly been more exact, had I had recourse to such means of making it so. Future political arithmeticians, possessed, I hope, of more perfect series of statistical facts than have yet been collected, will pursue this most interesting subject: in the mean time, I trust I may assume it as sufficiently demonstrable, that, in thus proportioning the number of the sexes at birth, and establishing a different law of mortality as affecting each, so as to cause that numerical excess, but still strictly necessary proportion, of females, which is found to exist at the nubile age, Providence has manifested, beyond all possibility of doubt, that so essential a part of the principle of population as the proportion of the sexes, is governed by laws which, however mysterious, are as certain in their operation as they are beneficial in their effects.

(18) But the best and happiest proof of the proper, though not numerical balance of the sexes, is founded upon the fact, that none seem doomed to involuntary celibacy by their being unequally proportioned. Very apparent would be the fact, and unhappy the consequences, were such the case: different in all respects to that single state which a certain and small number, of both sexes, voluntarily embrace. To a limited extent, indeed, the ravages of war, the rage for colonization, the thirst of gain, may have the effect of les-

sening the number of husbands in this country; and the consequences, it is feared, may be traced to that misery, infamy, and total ruin, that fall upon some of the loveliest of human beings: but, on the whole, it is as surprising, as it is cheering, to remark, how universal is the prevalence of marriage; and it is hard to determine, regarding the few who remain single, which sex prevails. Dr. Short asserts, that fewer females than males die unmarried; others presume the contrary; but the very uncertainty demonstrates the fact for which I contend, namely, the accurate provision for the universality of that institution which is the source of all the comforts and charities of existence, the guardian of public morality, and the foundation of all national greatness and prosperity.

(19) I am aware, however, that those who advocate a theory the very contrary to that principle which I am about to unfold, will concur, in the main, with what I have just advanced. They may even claim the minute regulations adverted to, as so many proofs of the existence of some fixed and unbending principle of population corroborative of the system for which they contend. In so doing, however, they will again fall into error. The physical law which governs the proportions in which the sexes are born, arbitrary and immutable as it has been generally held to be, is, nevertheless, a relative one; exhibiting, when closely examined, a series of minute adaptations to circumstances, variously affecting the species, and manifesting, in still clearer characters, the same overruling Cause in the perpetual act of frustrating whatever would interfere with the happiness of mankind, and providing for the fulfilment of his primeval command, the universal union of his offspring.

(20) But the development of this further regula-

tion, as new, I think, as it is curious and important, is reserved for the ensuing chapter; where, I hope, it will, as an appropriate introduction, prepare the reader for the reception of the principle of population about to be submitted to his consideration.

CHAPTER III.

OF THE LAW OF POPULATION: ANTICIPATORY COMPUTATIONS OF NATURE, ESPECIALLY IN REFERENCE TO THE PROPORTION OF THE SEXES.

(1) I PROCEED now to remark that the proportion of the sexes at birth, certain and stationary as it has usually been deemed, is nevertheless subject to a variation, hitherto little observed, and totally unaccounted for.

(2) Early in my inquiries regarding the subject of population, I had remarked this difference, and I was led to consider its probable cause and design by reading, in Mr. Malthus's Essay, the gloss put upon a passage of Aristotle in one of his theoretical works, recommending the postponement of the marriages of the male sex. Upon what is called that philosopher's "scheme for preserving the balance of population[1]," his commentator says, "Aristotle appears to have "seen this necessity" (that of checking population) "still more clearly. He fixes the proper age of "marriage at thirty-seven for the men, and eighteen "for the women; which must of course condemn a "great number of women to celibacy, as there never "can be so many men of thirty-seven, as there are "women of eighteen[2]."

(3) It has been already fully and undeniably proved, because upon his own express authority, that

[1] Malthus, Essay on Population, Index, in tit. Aristotle, Ed. 6.

[2] Malthus, Essay on Population, p. 167.

Aristotle's motive for this recommendation was not that here attributed to him, but directly the reverse. But it is of still more importance to shew, that were any society absurd enough to adopt such a regulation, with whatever motive, or wicked enough to do so with the intention of frustrating by such means the balance of the sexes at the usual period of their marriages respectively considered, Nature would thwart their intentions, and still vindicate her own institution. It was after some experience regarding the facts and deductions of the miserable theory I am opposing, that I came to the conclusion, that what it states as matters "of course," are, generally speaking, matters of fallacy, which, however, have often led to the discovery of truth by almost invariably pointing in a direction exactly opposite to it. Such, at least, was the case in the present instance; and when I read the deduction from the passage of Aristotle above quoted, I was prepared to expect a counteracting law of Providence; and I discovered it in the following principle of reproduction, which is as curious in its nature as it is important in its consequences.

(4) The proportion in which the sexes are born is governed and regulated by the difference in the ages of their parents, in such manner, that on the average, among the total of the births, the sex of that parent shall exceed in number, whose age exceeds; and further, that excess shall conform to the mortality which would take place in a period equal in duration to the interval between the ages of the parents; preserving, therefore, the balance of the sexes at the usual age at which they respectively marry. Thus, in any community where the males should habitually defer that connexion, Nature, as far as she was concerned, would counteract the evil of so pernicious a

custom in proportion to its general prevalence and to the mean term of the postponement; effecting and manifesting her purpose in this, as in all other cases, not in individual instances, but on the average of her operations. The physical and moral necessity, then, of this law of Nature is also perfectly clear; it is still a provision for the universality of the marriage union, even under circumstances like those contemplated by Aristotle, and which, in a corrupt state of society, become very general. I confess that, in this instance, I arrived at the principle now explained, otherwise than by induction. It was the desirableness of such a regulation in Nature which prompted me to search for its existence: the proofs by which, it is hoped, it is fully established, are given as they successively presented themselves to my consideration.

(5) Two facts, I think, may be assumed without the necessity of proofs being adduced; first, that where the marriages are least numerous in proportion to the marriageable part of the community, there the weddings are, in all probability, the longest deferred, and vice versâ; and, second, that this postponement, on the general average number of the cases, is always found to exist on the part of the male only; who, though he have put off his own marriage, is nevertheless quite averse from taking to wife a female who has in this respect followed his example, but, it is notorious to common observation, will generally make his choice on a directly opposite principle. It may, therefore, I think, be taken for granted, that the fewer the marriages, the older are the males, compared with the females, who contract them.

(6) Let us turn, then, to the English census, and compare it, in this respect, with that of Wales. In the former division of the empire I find the marriages

are given in the last population abstract as 1 in 133; in the latter, 1 in 156 only[1]; or, to take a more accurate principle of calculation, the mean amount of the population of England, as enumerated in 1810 and 1820, is 10,400,132, the marriages in this period 863,502, giving a proportion of 1660 weddings, or 3320 individuals married in every 20,000 inhabitants, or 162 more than the entire number calculated to the same radix existing between 20 and 30 years of age; which amounts to 3158[2]. In Wales the mean amount of the population, calculated from the censuses at the same periods, is 664,613; the total number of marriages 46,924, being 1427 weddings, or 2854 persons married in every 20,000—a smaller number by 142 than that of the existing population of the age of from 20 to 30 years, amounting to 2996. The marriages in England, compared with those of Wales, calculated on the same class in regard of age, are therefore more numerous in the proportion of 105 to 95, or above 10 per cent.; indicative, if the preceding observations are correct, of the earlier marriages of the males, and of a smaller difference between their ages and those of the females with whom they intermarry, in the former than in the latter portion of the empire; a fact which, I believe, common observation corroborates. Now the number of the male births in England between 1800 and 1820 was, according to the published registers, 2,975,125; of the female, 2,855,211, being a proportion of 1042 to 1000: whereas in Wales the births of the males in the same period were 158,109, and of the females 144,628, or 1093 to 1000; exhibiting a first proof of the principle in question[3].

(7) But to submit the same principle to the test of

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[1] Abstract, Population Report, 1821. Prelim. Obs., p. xxxiii.

[2] See Table XLVIII.

[3] Pop. Abstracts, 1811 and 1821.

local habits. In the large and manufacturing towns of this country, the males, in consequence of inducements already adverted to, marry earlier than in country districts, and, therefore, at nearer the same age as the females. My principle being true, we must, therefore, expect to find the sexes at birth more evenly balanced in numbers in the former than in the latter situations; and such is the fact. If we advert to the last census (any of the preceding ones would, however, exhibit the same interesting result), and compare the proportionate number of the sexes born in the metropolis, where about 1 in 100 are annually married, with those born in a country district, Cumberland, for instance, where it appears about 1 in 154 only are married, it will be found, that whereas, in London, the proportion of male to female births, for the ten years of the last census, is 1012 to 1000 only, that of Cumberland, for the same period, rises to 1101 to 1000[1]!

(8) But, of all situations, that of a large manufacturing place is the one in which the marriages of the males are contracted at the earliest period of life, indeed, considering the motive, already touched upon, which sometimes hastens that event, improperly soon. In such, it is needless to state, that the ages of the males and females at marriage are the nearest balanced. Let us, then, lastly take Manchester, where, during the same period, the marriages were as high as 1 in 91; but of the births, there were only 2 males more in 2000 than females, the proportion being 1002 to 1000: but in the Hundred of Lonsdale, south of the Sands, where the proportion of marriages is smaller than in Cumberland, or than in any other hundred of Lancashire, the births of the males were

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[1] Pop. Abstracts, 1811 and 1821.

1084 to 1000 females; a difference, compared with those of Manchester, of above 8 per cent[1].

(9) Regarding Scotland, no official registers have been yet published, but it is generally understood, that marriages there, are, on the part of the male, contracted somewhat later than here; a fact which I have found to apply, in some degree, even to the peerage of that division of the empire, compared with the same class of society in this. I believe it is equally true, that the postponement is greater on the part of the husband, than on that of the wife, in the weddings of our northern countrymen. The births of Scotland are, as before observed, not given; but the census of that country, divided into ages, affords quite as unequivocal a proof of the same principle as that of England, and the more striking, as varying its nature. In England, the males under 5, are to the females of that age as 1020 to 1000; in Scotland, as 1032 to 1000[2]. I shall not detain the reader by multiplying these local evidences of this surprising regulation of Nature, nor yet exemplify it by comparisons instituted between different countries, but shall proceed to still more cogent proofs of its existence.

(10) It must be obvious, that illegitimate births, resulting, as they generally do, from the earliest connexions on the part of the male, belong to parents more nearly of an age than legitimate ones. I have consequently invariably found, conformably to the principle in question, that, in every country, amongst this unfortunate class, the females are proportionably more numerous than the males, and the sexes, therefore, nearer upon an equality in numbers. I shall only present a few instances, observing, at the same

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[1] Pop. Abstracts, 1811 and 1821.

[2] Ibid.

time, that I have never seen any statistical tables, containing the necessary information, which have not shewn similar results. M. Nicander has collected the births in Sweden and Finland, from the years 1775 to 1795, a period of twenty years, distinguishing the legitimate and illegitimate, and the sexes of each. M. Morgue made similar collections, extending to a period of 21 years, from 1771 to 1792, at Montpellier in France; in which country, of late years, the like information has been communicated on official authority. From Naples, too, the same facts have been obtained, and likewise from Prussia. Other countries and districts might equally be appealed to on this point; but a few of the foregoing instances may suffice, and they are presented to the reader as follows:

Table LIII.

	Years.	Legitimate.		Illegitimate.		Proportions.		
		Males.	Females.	Males.	Females.	Legit. Males.	Illegit. Males.	Females of each Class.
Sweden	20	968,720	927,940	37,700	37,060	1044	1017	1000
Montpellier	21	11,546	10,783	1,373	1,362	1071	1008	1000
France	8	3,694,296	3,463,678	272,040	259,144	1066	1049	1000
Prussia	8	1,838,914	1,733,337	138,274	134,530	1061	1027	1000
		6,513,476	6,135,738	449,387	432,096	1062	1040	1000

(11) The above table, which might be greatly enlarged, were it necessary, exhibits these important facts. In the same countries and districts, and consequently, where climate and situation can have no influence on the results, the births of legitimate male children are in every case more numerous, in propor-

tion to female children, than illegitimate ones, and on the whole numbers given in the proportion of 1062 to 1040.

(12) The births in the foundling hospitals of every country furnish the same results as those just presented to the reader, and for precisely the same reason, namely, because they are, generally speaking, illegitimate. It is superfluous, however, to adduce proofs of the truth of a fact which has been conspicuously apparent ever since this branch of statistics has been placed under public notice[1].

(13) It may be perhaps said, that the argument, hitherto, has only proved, with certainty, that early connexions are productive of more female births than later ones; which Mr. Milne and others have stated to be the case[2]. But this is not the law of Nature, and if it were, it could answer no one conceivable purpose, much less that which so plainly evinces the con-

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[1] Various have been the causes assigned for this singular fact. I find, in a paper of Mr. Babbage, in the Edinburgh Journal of Science for June, 1829, proofs that in the illegitimate births of the different countries he mentions, there is a greater proportion of females than in the legitimate ones; a circumstance which, as mentioned above, has been long since observed. I do not perceive, however, that that profound mathematician has applied the fact to the illustration of any general principle, or extended his remarks to the variations which occur amongst legitimate births in different places and countries. And since I constructed the above argument, a paper in the Bulletin Universel, vol. xii., pp. 3, 4, &c. has been pointed out to me, which mentions that a series of observations have been made by M. Giron de Buzzaringues upon a flock of sheep, which went to prove that on dividing it into two equal parts, and putting the very young males to the vigorous females, more females would be produced, and vice versâ; but still failing from this fact, so interesting as a corroboration of the principle for which I contend, to deduce what I conceive to be the just principle. On the contrary, drawing this conclusion from it; "lorsque les forces actives pré- "dominent chez les animaux accouplés, "cette condition favorise la procréation "des mâles; la diminution des forces "actives ou motrices produit un effet "opposé." Then follows the application of this doctrine to the births of the human race, as exemplified in the different departments of France, classed according to the general occupation and employment of their respective inhabitants, which I shall not quote, being convinced that the question is determined upon principles essentially different, and that the causes which are assigned as regulating the relative number of the births of the sexes there, have no further connexion with the results in question than as merely occasioning those variations in the period of the matrimonial union which really regulates them.

[2] Milne, Treatise on Annuities, vol. ii., p. 493.

stant and minute regulation of this as well as every other provision in the true system of population, constituting it a principle of universal benevolence, —a conclusion which the abettors of the theory of the arithmetical and geometric ratios recognize only to ridicule. I proceed, however, to advance a further and last proof of the existence of that governing cause, regulating the relative numbers of the sexes, which I have developed; and one which, it is conceived, will at the same time establish the fact and furnish an answer to all those objections or doubts with which it might be assailed.

(14) I find, by a reference to the synoptical register of the Peerage of the United Kingdom, to which I have elsewhere referred for other important purposes, that it is not the ages of the peers at marriage which determines the proportion of the sexes of their children. I have ascertained that age in 1027 cases of fruitful marriages, and the following are the results:

TABLE LIV.

EXHIBITING THE AGES OF 1027 PEERS AT THEIR MARRIAGE, AND THE NUMBER AND SEX OF THEIR CHILDREN.

Age of the Peers at Marriage.	Number of Marriages.	Male Births.	Female Births.	Proportion of Males.	Proportion of Females.
Under 21	54	143	124	1153	1000
21 to 26	307	668	712	938	1000
26 to 31	284	696	609	1143	1000
31 to 36	137	298	263	1133	1000
36 to 41	90	149	151	987	1000
41 to 46	58	93	83	1120	1000
46 to 51	51	79	83	952	1000
51 to 56	19	15	11	1363	1000
56 to 61	11	12	6	2000	1000
61 to 66	12	3	4	750	1000
66 and upwards.	4	2	4	500	1000
Totals . . .	1027	2158	2050	1052	1000

The above table, therefore, the intended accuracy of which I avouch, disposes of the supposition that the advanced age of the male increases the number of the male births: that circumstance, simply considered, it is obvious, has no reference whatever to the proportionment of the sexes.

(15) Neither has the age of the female parent at marriage, separately considered, any greater influence on the proportion of the sexes she produces than that of the male, as will appear from the 471 instances of fruitful marriages adduced in the succeeding table,

being the whole number of peeresses whose age at marriage I could ascertain.

TABLE LV.

EXHIBITING THE AGES OF 471 PEERESSES AT THEIR MARRIAGE, AND THE NUMBER AND SEX OF THEIR CHILDREN.

Ages of the Peeresses at Marriage.	Number of Marriages.	Male Births.	Female Births.	Proportion of Males.	Proportion of Females.
Under 16	13	37	33	1121	1000
16 to 21	177	502	387	1299	1000
21 to 26	191	512	485	1055	1000
26 to 31	60	115	92	1250	1000
31 to 36	21	40	36	1110	1000
36 and upwards.	9	13	13	1000	1000

It is perfectly clear, therefore, as far as these instances can prove it, that it is not the age of the female parent at marriage which influences the proportion of the sexes she produces.

(16) The following table, however, constructed on the same authority, (the registers of the peerage,) will, it is believed, place the principle advanced in this chapter beyond all doubt, and prove that it is the relative ages of the parents which really adjusts the proportions of the sexes at birth. It is calculated upon 381 instances of first marriages, being the whole number in which the ages of both parties could be ascertained: nor was that number obtained without a much longer and more laborious research than, perhaps, can well be imagined.

TABLE LVI.

SHEWING THE INFLUENCE WHICH THE DIFFERENCE IN THE AGES OF THE PARENTS, RESPECTIVELY, HAS IN REGULATING THE PROPORTION OF THE SEXES OF THEIR CHILDREN. TAKEN FROM THE REGISTERS OF THE PEERAGE.

Difference of Age, the Husband being	Number of Marriages.	Male Births.	Female Births.	Being as Males	to Females
Younger	54	122	141	1000	1156
Equal Age	18	54	57	1000	1055
Older 1 to 6 Years	126	366	353	1000	964
6 to 11	107	327	258	1000	789
11 to 16	43	143	97	1000	678
16 to 21	22	48	30	1000	625
21 and upwards.	11	45	27	1000	600

(17) The above table, therefore, completely answers the comment put upon Aristotle's recommendation, and rescues him from the imputation of discouraging population: an imputation, however, which any one acquainted with the general tenour of his works knows to be erroneous. It does far more; it shews, as clearly as facts can demonstrate any thing, that there is a principle in Nature which counteracts the consequences of those perverse habits in regard to the postponement of the period of marriage of one sex in comparison with that of the other, which would otherwise occasion the most pernicious effects in any community in which it should prevail. Without, therefore, alluding to those rarer cases in the table in which the age of the females exceeds that of the males at marriage, or those in which it is equal, in which instance,

also, physically considered, the males may still be justly regarded as the juniors in constitution, and where, consequently, the excess of the female children, resulting from such marriages, corroborates the general argument by a most important converse proof; let us commence with that section in which, the difference in age at marriage being from one to six years, the sexes may be justly regarded as being, in a natural point of view, contemporary: and we there find the proportion of males and females born (1000 to 964) is that which seems to anticipate the excess of mortality in the former sex up to the nubile age, so accurately as to produce that balance of their numbers which, as before observed, is found to exist at that period. To preserve that balance, so essential to the preservation of the population, when the males habitually postpone marriage, it will be seen that the proportion of male births increases with the term of that postponement, and conformably to the law of mortality. In order to exemplify and prove the latter fact, I shall now add another column, in which the proportionate number of males existing at the ages specified are given from Table XLVIII. in the Supplement to Book III., which will shew, with a greater precision than I conceived could have been established by the averages of so limited a number of instances, how minutely all the anticipatory processes of reproduction are calculated, and how certainly they are accomplished. Had the collection of cases been sufficiently great, I am fully persuaded that the aberrations in the following table, unimportant as they now are, would have entirely disappeared.

TABLE LVII.

SHEWING THAT THE DIFFERENCE IN THE PROPORTION OF THE SEXES AT BIRTH, WHICH IS GOVERNED BY THE DIFFERENCE IN THE AGES OF THE PARENTS, RESPECTIVELY, IS ADJUSTED TO THE LAW OF MORTALITY.

Difference in age, the Husband older by	To every 1000 Male Births, Female ditto.	Diminution per Centum.	Husband's assumed age, on an average of 5 Years.	Number of Males in each 5 Years, according to Table XLVIII.	Diminution per Centum.
1 to 6	964	..	21	827	..
6 to 11	789	22.18	26	667	24.98
11 to 16	678	42.18	31	600	37.83
16 to 21	625	54.24	36	550	50.36
21 and upwards.	600	60.06	41	500	65.40
		178.66			178.57

(18) The results presented by the foregoing table are so strikingly confirmatory of the principle advanced, that a suspicion may perhaps be excited that they have been obtained by some kind of selection or management. The contrary is, however, the case: and the ultimate coincidence of facts apparently unconnected, and collected originally for purposes entirely different from the present, was not less surprising to the author than it will probably be to the reader. I was prepared, indeed, by the train of proofs previously adduced, to expect the information collected in the last table to afford additional and unequivocal evidence of the truth of the position advanced; but I by no means anticipated results of so exact and regular a character, especially from so limited a number of facts.

(19) But it may, perhaps, be said that the last

column but one in the preceding table does not express the law of mortality in this country, but rather the law of population, differing as the latter unquestionably does from the former, in consequence of the increase of population, as well as of emigrations, &c., and exhibiting, therefore, a greater apparent diminution in the consecutive ages, especially of the males, than that which is occasioned by mortality only. It is admitted; and I now, therefore, come to a last remark on this most curious subject.

(20) It has been already mentioned that the preceding table has been constructed on the results of first marriages only. Now it is a most singular fact, that in the after-marriages, on the part of the husband, though such, it is evident, must be contracted at a later age than first ones, and, generally speaking, when the disparity in years between the husband and wife is greater, still the female births, contrary to the case as it respects first connexions, are, under whatever circumstances as to the relative ages of the parents, on the average more numerous than the male, and vice versâ. In the registers so often adverted to, the number of the second and subsequent marriages of those peers whose ages at marriage, together with that of their peeresses, could be ascertained, is 54; the male births resulting from which were 117, the female 129. In mentioning so curious a fact I do not presume to pronounce it to be fully established as a general law of nature, though I have adverted to other documentary proofs besides those furnished by the peerage, and have invariably found an excess of female children attending those marriages in which the father had been previously married. In extending my examination of the peerage registers beyond those instances where the age of both the

parents could be ascertained, and where that of the father was alone given, I obtained 107 instances, and found that these produced 460 children, 204 of whom were male, and 256 female. It may, perhaps, be interesting to the reader to give the exact results, which will shew the certainty of the fact, and that it is not affected by the age of the parent.

TABLE LVIII.

SHEWING, FROM THE REGISTERS OF THE PEERAGE, THAT THE MARRIAGES OF WIDOWERS ARE ATTENDED BY AN EXCESS OF FEMALE CHILDREN.

Ages of the Widowers at their Marriages.	Number of 2nd and 3rd Marriages.	Male Children.	Female Children.	Proportion of	
				Males.	Females.
Years.					
22 to 27	5	21	23	913	1000
27 to 32	18	33	39	846	1000
32 to 37	24	51	66	773	1000
37 to 42	17	29	32	906	1000
42 to 47	16	30	38	790	1000
47 to 52	15	30	43	699	1000
52 to 57	3	2	3	666	1000
57 to 62	3	3	4	750	1000
62 to 67	3	3	4	750	1000
67 and upwards.	3	2	4	500	1000
	107	204	256	797	1000

(21) It will not be denied, I think, but that this provision of Nature attending second marriages would compensate for the difference between the law of mortality and that of population, as noticed in a

preceding section, and fully justify the conclusion that the difference in the proportion of the sexes at birth is so regulated as to preserve that equipoise at the nubile period essential to the purposes of Nature. Adverting, however, to the proportion of such marriages, as previously computed, the physical fact last noticed may indeed seem to render the calculation unnecessarily complex; but, on due consideration, I think it will appear otherwise; like many other of the operations of the Deity, accomplishing at once a variety of purposes, all clearly resolvable into his essential attributes of wisdom and benevolence. But I will not venture to explain the moral necessity for what I conceive may be a most singular rule of Nature, leaving it rather to the reader's perception.

(22) Hitherto we have been considering those laws of Nature, the obvious design of which is to secure the increase of the species: it only remains that we should notice one or two of an opposite, and equally important tendency; namely, those which are calculated to prevent their undue multiplication.

(23) It has been already observed that marriage is the sole conservator of the human race. Now this institution, it is quite obvious, limits, in effect, the period of male fruitfulness by that of the female; and the latter, it is unnecessary to remark, is shorter in reference to the whole term of existence, than, probably, in any other animated being in creation. Reckoning from the period of birth to that of mature age, the possible extent of that term barely comprises half the duration of life; its actual continuance, calculated on the average, falls short, probably, of a fifth of it; while another provision of Nature, which usually prevents the pregnancy of the female while she is performing that important duty which the vast majority of

mothers cannot delegate to others,—the feeding of her infant offspring at the bosom,—has the effect of still further diminishing the actually prolific season of life. Thus, then, at the very outset of the argument, human increase seems so limited as to guard against a too rapid augmentation of the numbers of mankind, and by means which, when duly considered, rise into so many direct manifestations of the tender regard of the First Great Cause for his offspring; securing the health of the mother by fixing the term of prolificness, limited as we have remarked it to be, at the most vigorous age; and, thus keeping the generations so apart, as to leave a sufficient space in which to exercise those charities, whether parental or filial, on which the health, the happiness, and the very existence of the human race depend.

(24) But to return. Even this period of female prolificness, physically limited and defined as it is, does not, any more than all the other processes of reproduction, conform to an inflexible law, operating equally under all circumstances, however different from each other. On the contrary, it manifests an adaptation to the state and situation of human beings, the more striking, because this provision of Nature, in reference to population, is, at all events, beyond the reach of human interference or control.

(25) First, then, it is too notorious a fact to need any proofs being adduced to establish it, that the period of female prolificness commences much earlier in some countries than in others; in the warmer climates, for instance. Now, if in the cases where that period is thus antedated, it should still be lengthened to as advanced an age as in those where it takes place later, it is obvious that; with an equal degree of annual fecundity, the increase in the population would be

the greatest where that state commenced the earliest, and therefore continued the longest; arguing either an excess of prolificness in the one instance, or a deficiency in the other. Such, however, is not the dilemma in which the laws of Nature have left the human race. On the contrary, it is universally known, that where the reproductive period commences soon in life, there it terminates, at least, proportionably early. The United States of America, so often appealed to on the subject of population, exemplify this fact, and prove it beyond contradiction.

(26) But still it may be urged that, supposing the whole period of female prolificness, which thus varies in its date, to remain equal in duration, it is clear that in those countries where it commences the earliest, the births would take place the soonest; and as the generations must therefore be more crowded upon each other, the population would necessarily augment more rapidly. The coexisting numbers would, in such case, be greater than where the commencement of human fecundity was deferred, and the generations, consequently, placed more apart. But against this consequence Nature has also provided, in having abridged the length of that term in the female, in proportion as its commencement is antedated. This also is a fact, too universally notorious to need any accumulation of proofs to establish it. Again, to instance America, where the period in question, compared with that in the northern countries of Europe, is forestalled a few years, it is abridged in its duration, at least, twice as many; and in India, as a celebrated natural philosopher has observed, "where the human female "commences to be prolific at eight, she ceases to "remain so before she attains thirty."

(27) I shall here terminate the proofs of what I

have ventured to call the anticipatory computations of Nature relative to the law of population; which, neververtheless, might have been considerably multiplied. Enough, however, it is confidently hoped, has been advanced to prove that every thing connected with even the preparatory processes of human reproduction is regulated, not by fixed and arbitrary, but by varying and relative proportions, involving a series of secondary causes, all contributing to the same end; the due increase of the species. After these ample (I had almost said, miraculous) proofs of the Divine intention, in this respect; to suppose that His purposes are, nevertheless, frustrated, and that the final result of the whole is left so uncertain, or rather erroneous, as to be rectified by vice, misery, and moral restraint, or, in plainer terms, by resisting the physical, or rebelling against the moral, laws of God, were absurd and blasphemous. If only thus far of the Divine calculations relating to this all-important subject were apparent, and its final conclusion still involved in essential mystery, or lost in the imperfect knowledge of the present or the obscurer records of past ages, still in these we have abundant proofs as to the benevolent purposes of the Deity. But if we trace the subject yet further, we shall find that all remaining doubts will vanish, and the principle of population will be found regulated by the numbers, and adapted to the circumstances, of human beings. To the development and proof of such a law, the remaining part of this treatise is devoted.

CHAPTER IV.

OF THE LAW OF POPULATION: THE PRINCIPLE DEFINED.

(1) No one fact relative to the human species is more clearly ascertained, whether by general observation or actual proof, than that their fecundity varies in different communities and countries[1]. The principle which effects this variation, without the necessity of those cruel and unnatural expedients so frequently adverted to, constitutes what I presume to call THE LAW OF POPULATION, and that law may be thus briefly enunciated:

THE PROLIFICNESS OF HUMAN BEINGS, OTHERWISE SIMILARLY CIRCUMSTANCED, VARIES INVERSELY AS THEIR NUMBERS.

(2) The preceding definition may be thus amplified and explained. Premising, as a mere truism, that marriages under precisely similar circumstances will, on the average, be equally fruitful everywhere, I proceed to state, first, that the prolificness of a given number of marriages will, all other circumstances being the same, vary in proportion to the condensation of the population, so that that prolificness shall be greatest where the numbers on an equal space are the fewest, and, on the contrary, the smallest where those numbers are the largest.

(3) Thus far the theory announced has reference to space only, and even then it is, if proved, of incalculable importance to human beings, in indicating a system of population so regulated as to people the

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[1] Dr. Davenant, Works, vol. ii., p. 180. Malte-Brun, vol. ii., p. 555. Jarrold, Dissertations on Man, pp. 184, 287.

earth where it is uninhabited, or to restore the number of its inhabitants where they are unhappily wasted, without at the same time threatening to overwhelm it with a continued and arbitrary increase; and the very exceptions to this rule, as referrible to space only, will be found to confirm its main principle, for—

(4) The prolificness of human beings, as thus regulated by the extent of the space they occupy, is furthermore influenced by the quality of that space, or otherwise by its potential produce; so that the same number of marriages in a population occupying an equal surface, will, all other circumstances remaining equal, be less productive in mountainous than in champaign countries, and less in the frigid than in the temperate regions.

(5) When I first detected this general law of Nature as apparently regulated by space only, I confess I was disappointed in finding that it failed when applied to the above exceptions, where, had mere room been the sole governing principle, it ought to have been particularly manifest: a little consideration, however, convinced me of the necessity of such variations, as an opposite result would, in those instances, have been fatal to the theory as a law of benevolence applicable to all countries and conditions, and have doomed mankind, under certain circumstances, to an increase beyond the ultimate means of subsistence, and, consequently, would so far have identified my argument with that which I am opposing. In this instance, however, as in every other, I adhered to and allowed full weight to facts as they arose, and these ultimately formed themselves into that system which, together with its proofs, will be fully submitted to the reader, who will judge of their harmony and truth. Though these ex-

ceptions, therefore, may seem to divest the argument of somewhat of its mathematical precision, yet, when duly considered, they add to it a moral demonstration of incalculable weight, in proving that the prolificness of human beings is regulated by the space they occupy with a further reference to its potential produce, or, in other words, to the means of their subsistence.

(6) Let not those, however, who may be adverse to the principle already partly propounded, if such there be, anticipate a failure in its proof, from supposing that these exceptions will be either so numerous or so important as to confuse the main argument. Even according to the last view of the subject, space may be still generally regarded as the chief, though not sole, regulator of human prolificness; and the ensuing calculations, it will be seen, will establish the principle with sufficient minuteness and certainty. Nor ought it to be otherwise. The great mass of civilized society, at least that part of it with the statistics of which we are alone conversant, and from which, therefore, our proofs will have to be chiefly derived, inhabits the temperate and fertile regions of the earth, the variation in the productiveness of which is, on the main, but little, and that little rendered still less by the continued efforts of an industry which can overcome all but physical obstacles, and, indeed, partly remove even them.

(7) But in the circumstances contemplated in the primary definition as operative on the measure of human prolificness, there is one which remains to be noticed, distinct from either the extent of space, or its fertility; and it is this,—the prevailing measure of mortality. Lastly, then, the prolificness of an equal number of individuals, other circumstances being similar, is greater where the mortality is greater, and,

on the contrary, smaller where the mortality is less; and assuming the design of the law of population to have been rightly stated, this regulation also is obviously necessary for its accomplishment.

(8) The mode by which this law operates is likewise apparent; and, while it confirms the general principle, is itself susceptible of a very satisfactory numerical demonstration. This mode is still in direct opposition to that of the contrary theory, which pronounces vice, misery, and what it calls moral restraint, the regulators of population; whereas, according to the system now before the reader, ease and affluence, which increase with increasing numbers, diminish, as they prevail, the prolificness, and consequently limit the multiplication of mankind. A smaller or larger number of inhabitants, therefore, on the same space, placed under circumstances otherwise equal, will imply a less or greater degree of that ease and affluence, and consequently operate on their prolificness agreeably to the positions primarily advanced. The exceptions to this rule of nature, such as new colonies, &c., are evidently deducible from it; and, considered either in themselves or their relations, it will be shewn, as plainly confirm it. Meantime the facts which the history of human beings present, substantiate the general position beyond the possibility of denial, and the principles of physiology, as well as the analogies of nature, illustrate and confirm it.

(9) Other regulations flowing from the same general principle, of a most minute and curious nature, have been detected during the course of the present long inquiry. These, however, will not be now brought forward; what has been already advanced is sufficient fully to exhibit, both as to its principle and operation, the law of population for which I contend, as that of

nature and of truth, and which it is the purpose of this Book to establish. In presenting it, therefore, in a few words to the reader, I will contrast it with the theory it opposes. The latter assumes that Nature, or rather as it unequivocally intimates, GOD himself, has, in order to people his universe, invested man with a fixed and unvarying measure of prolificness, constantly tending to excess and misery; and that, therefore, this blind and blundering calculation has to be perpetually regulated by human interference, which we may be assured will constantly manifest itself in partiality and cruelty. Hence, however it may be theoretically regarded, yet practically considered, it is not attempted to be denied, but that disgusting vice, as well as abject misery amongst the many, is the price at which the privileged few must monopolize a sufficiency of the bounties of Nature. But its principles and details are before the reader, and let them be distinctly remembered while I ask him if such a notion is not contradicted by the experience of man in the best and happiest periods of his history, and whether it be not almost impossible to reconcile it with any received notions of religion, natural or revealed,—with any worthy conceptions of the care of an eternal Providence,—with any adequate belief in the very being of a GOD and his essential attributes? On the contrary, the law of population now developed, has an equal tendency with the former to people the world, or to recruit its inhabitants in any particular country, where they may have been wasted, and consequently to replenish the earth with happiness, in as far as enjoyment is connected with life; but it is so regulated as not to defeat its plain and only purpose, by producing an excess which would convert that happiness into suffering. Moreover its operation is not necessarily attended with misery present or prospective; on the contrary, by connecting increasing numbers with increasing prosperity, and rendering the latter the regulator of the former, it is, as by a constant effort, perpetually elevating human enjoyment to the utmost possible height, and extending it to the greatest possible number; guarding nevertheless against an excess which would be fatal to both. Its moral design likewise, if this can be gathered from its undeniable effects, is equally benevolent. The augmentation of the whole involves the improvement of each, and thus, in multiplying, it regenerates the species. When properly viewed, therefore, it teaches the patriot his most important duties, and inspires the philanthropist with his most glowing anticipations: it liberates society from that principle of selfishness which is at once its bane and its disgrace. In a word, it combines the duties, the feelings, and the interests of human beings, and lays the whole in one united and perpetual act of gratitude at the footstool of the Eternal Benefactor. Such are the necessary consequences of the more benevolent system; and I challenge any one to say that they are overcharged if they are true; or to deny their truth if he can believe that the Creator has, in virtue of that prescience, and conformably to that benevolence he has manifested in all other of his visible works, himself regulated the prolificness of his creatures in reference to the circumstances in which his providence shall place them, instead of leaving that regulation, minute as it will be seen it is in itself, to the busy, selfish, and ignorant interference of men who, on every possible view of the subject, are as incompetent to the task they are eager to assume, as they are to that of creation!

CHAPTER V.

OF THE LAW OF POPULATION: ITS PROOFS ENUMERATED.

(1) It has been stated that the prolificness of human beings, under similar circumstances, varies inversely as their numbers. I proceed to prove this important principle,

First; By generally acknowledged facts.

Second; By the comparative prolificness of marriages in different countries, equally circumstanced, except in regard to population.

Third; By the comparative prolificness of marriages in different districts of the same countries.

Fourth; By the comparative prolificness of marriages in towns, in relation to the number of their inhabitants.

Fifth; By the comparative prolificness of marriages in the same countries and districts at different periods, as the population has increased.

Sixth; By the comparative prolificness of marriages in the same places and districts, at different periods, where the population has diminished.

Seventh; By the comparative prolificness of marriages as determined upon physiological principles.

Eighth; By the analogies of the animal and vegetable kingdoms, in regard to the principle of reproduction.

Ninth; By the demonstration afforded by distinct classes of the human species; and especially the British peerage.

I am not aware that there are any tests to which the principle in question can be submitted, whether with a view to demonstrate or overthrow it, that are not clearly reducible to some of the foregoing heads: I proceed, therefore, to give them, severally, all the consideration, and advance all the facts in relation to each, which it is in my power to do.

(2) First, then, that the prolificness of marriages varies inversely as their numbers, I hold to be a truth established by general observation. And on this branch of the argument I think myself peculiarly fortunate, because, none will be found hardy enough to deny the facts on which it rests; nor yet the circumstances attending those facts: and though the latter, when superficially viewed, may have obscured the true principle of increase, and even led to the substitution of an opposite theory, still, on due examination, they will be found to confirm the true deduction, and to render it the more indisputable.

(3) I assert, then, that the prolificness of marriages is everywhere regulated by the state of the population, and is, *cæteris paribus*, the greatest where the inhabitants are the fewest on a given space, and on the contrary: in other words, that in country places they are the most prolific; in moderate sized towns, less; and in large towns and cities, the least so. How often has this fact been mentioned as incontrovertible, and when has it been once denied? Philosophers and physicians concur with common observers in establishing a truth, which seems too obvious and certain to need any particular proof; a few authorities, however, shall be advanced, premising, that the extent of the variation in question was the only subject of inquiry and observation; its existence was never supposed disputable.

4) Gregory King, one of the earliest and most accurate of our statistical authorities, states, that at

the period in which he wrote, the fecundity of marriages was, upon the average, in the country, $4\frac{8}{10}$ children each; in moderate sized towns, (which, it must be recollected, were then small compared with what they have become under the manufacturing system,) $4\frac{5}{10}$; and in the metropolis 4.[1] The last proportion, I think, he overrated. Rousseau contrasts, in very strong terms, the sterility of the females in towns with the prolificness of those residing in the country[2]. A more accurate and patient observer, Dr. Short, remarks upon the general fruitfulness of country breeders compared with those of towns[3]. Dr. Black, in his Medical Analysis, enters into particulars, and says, that marriages in cities produce sometimes under three children; generally between three and four, seldom four; whereas, in country places and villages, they seldom produce less than four, and generally between four and five at a medium[4]. Dr. Price, speaking of country places and towns where registers have been kept, says, that in the former (country places), marriages, one with another, seldom produce less than 4 children each; generally between 4 and 5, and sometimes above 5; but in towns this proportion is generally between 3 and 4 to each marriage[5]. Dr. Perceval remarks, that though the town is more filled than the country with inhabitants in the most vigorous periods of life, yet one child in four less is born in the town than in the country[6]. Muret notices of France, that in small parishes the births were 1 in 23 or 24; in small towns 1 in 25; in Lyons 1 in 28[7]; had he given the proportion that existed in the metropolis at that period, it would have still further illustrated the principle under consideration. Necker gives these proportions as from 1 in 23 to 1 in 30; observing, that 1 in 25, 25½, and 26 prevailed in the greatest part of France; in cities, 1 in 27, 28, 29, and 30, according to their extent. The celebrated modern geographer, Malte-Brun, also observes, that the proportion of this fertility varies with the situation. In country places, he says, there is frequently born 1 yearly in every 22 of the population. In towns, the proportion is less favourable, being often 1 in 40, more generally 1 in 35;[1] he, however, conceals from himself and his readers the real cause, the law of Nature under consideration, and, like all the foregoing authorities, who allude to it, substitutes another, consistent with the theory of human superfecundity, and, therefore, requiring "checks." The last writer I shall quote (for it would be a useless, and indeed endless, task, to adduce all the authorities who have asserted in substance the same fact) is M. Villot[2]; he says that the mean average of prolificness in France is 1 birth to 28.353 inhabitants; that for the cities, the proportion is 1 in 29 or 30, while for Paris, it is 1 in 31.04 only. He asks whether the difference proceeds from errors in the censuses, or is produced by other peculiar circumstances; and adds, that this is a point which the authorities alone can clear up, and that it merits all their attention. His queries may, I hope, be satisfactorily answered: the variation arises not from any incorrectness in the census, or from any peculiar circumstances; it is a law of Nature, and human authorities have nothing to do with it, but to form their

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[1] Gregory King, Chalmers' Estimate, p. 420.

[2] Rousseau, Essay on Education, vol. ii., p. 184.

[3] Dr. Short, New Observations on the Bills, &c., p. 121.

[4] Dr. Black, Medical Analysis, p. 14.

[5] Dr. Price, Reversionary Payments.

[6] Perceval, Works, vol. ii., p. 227.

[7] Necker.

[1] Malte-Brun, Geog., vol. i., p. 555.

[2] Villot, Bulletin Universel, tom. i., p. 42.

principles, and regulate their conduct by its universal ordination.

(5) In some of the preceding remarks, I may have seemed to anticipate those arithmetical proofs of the real principle of population, which are reserved for a further stage of the argument; but I could not wholly avoid so doing, in shewing that the general principle for which I contend is sanctioned by universal observation. If, then, it be an undeniable fact, and undeniable and undenied I believe it to be, that human fecundity is observed to be the feeblest where the existing numbers are the most condensated, or, in other words, does the least where there seems least to be done, and that its operations are graduated by that intelligible rule; so that in country places the fertility of marriages shall be greatest, in moderate-sized towns less, and in great cities least of all; then, (without at all adverting to the law of mortality, which is incontrovertibly regulated with the same view,) as in any terms of doubling whatsoever, the villages must, of course, in many instances, become towns, and these again rise into populous cities, varying, by this very progression, the fecundity of marriages as before stated—what becomes of the regular geometric ratio of human increase? It utterly and for ever fails. The very elements of the calculation, as applied to the necessary condition of society in whatever state, are totally irreconcileable with any such result. It is not only a fallacious, but an impossible theory, which, instead of being ensconced in "an impregnable fortress[1]," as its principal champion confidently pronounces, is placed on so fundamental an error, that the slightest consideration must serve to overthrow it, leaving room, it may be hoped, for a system more

[1] Malthus, Essay on Population, preface, vi.

befitting the character of the Creator and the condition of his creatures, to be erected in its stead.

(6) I am aware that it may be urged against this otherwise decisive argument, and indeed it has been by anticipation so said already, that the checks to population are more prevalent in towns and crowded situations than in country places: and were that supposition to be conceded, as the natural consequence of such a state of society, still, if the means of subsistence are dispensed with equal liberality in the former as in the latter situations, (and that the towns have the advantage in that respect, their more rapid increase fully demonstrates,) I cannot see how the proposition that there is a constant tendency in human increase to surpass the means of sustentation, can possibly be maintained. As to the "checks," as they are termed, which are to reconcile the difference, these have already been considered; and I will, therefore, only observe here, in reference to the main hope of the entire theory, the "preventive" one, that although it has been confidently advanced that the marriages in towns are less early and frequent than in country places, yet the very reverse of this assertion is the undeniable fact. Every writer who has sufficiently examined the subject observes, that marriages are proportionably more numerous in the former than in the latter districts. Gregory King gives the proportions as follows:—In the country, 1 marriage in every 141 inhabitants; in large towns, 1 in 128; in London, 1 in 106[1]. And as marriages are proportionably more numerous, that they take place earlier where the population is thus condensated follows of course; hence, "it is evident," says that most patient observer, Dr. Short, "that people marry earlier in

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[1] Gregory King, Chalmers' Estimate, p. 420.

"towns than in the country [1]." That the statistics of this and every other country bear witness, in the most striking and unequivocal manner to this fact, I can, after due examination, confidently assert, and shall, in a subsequent chapter of this Book, fully prove; and I challenge the contradiction of all those who have maintained the contrary.

(7) What, then, should have obscured from notice the principle now enunciated, or, when declared, have exposed it to the keen and unanimous derision of the economists, as an absurd and visionary theory? Isolated facts had long been observed, from which the principle contended for ought to have been established by the method of induction. That an apple would fall to the ground was not more certainly known, than that human prolificness is diminished by a crowded population. Is it not, therefore, marvellous that the one fact should have led to the discovery of the law of gravitation, and that the other should not have established the real law of population? On the contrary, the geometric ratio of human increase has been confidently announced and eagerly embraced, though it is, whether regarded as a theoretical or practical principle, one of the most despicable sophisms that ever abused the understanding, or debased the heart of human beings.

[1] Dr. Short, New Observations, &c., p. 77.

CHAPTER VI.

OF THE LAW OF POPULATION, AS PROVED BY THE VARYING PROLIFICNESS OF DIFFERENT COUNTRIES.

(1) I PROCEED, secondly, to prove the law of population, as previously explained by a comparison of human prolificness in different countries, variously peopled, but otherwise placed under somewhat similar circumstances.

(2) But I must first remark, that independently of the variations in the soil and surface, in their respective climates, and in the prevailing ratios of mortality in different nations, all of which, as it has been already observed, and will be subsequently shewn, have a direct influence on the principle of human fecundity, and consequently rendering this branch of the argument one of some complexity: there are other circumstances of a perfectly distinct character, which have to be taken into consideration before the results, about to be appealed to, can be fairly appreciated.

(3) The circumstances to which I principally allude are these: first, the inaccuracies in the statistical documents of the few countries which have hitherto collected and published the data on which alone the particular proof now under consideration can rest. Were these inaccuracies proportionate every where, so as to balance each other, the relative correctness of the whole would be secured, at least so as to answer the purpose of the present argument; but a variety of important considerations forbids us to hope that this can be the case. That the statistics of several different

countries are relatively incorrect, I could give, were it necessary, several incontrovertible proofs; the fact, however, is too obvious to render any necessary.

(4) But, second, were these various statistical data not only relatively but absolutely accurate, still there remains a variety of important causes, local and limited in their existence and operation, which must sensibly vary the fecundity of marriages in different countries, and, perhaps, not always conformably to the law of population contended for; which aberrations, under such circumstances, by no means disprove its existence as a principle of Nature, where her operations are left to their unconstrained development. These disturbing causes, if I may so express myself, are various, and need not be here enumerated; they will be found to class themselves under those inveterate customs, immoral habits, or pernicious regulations, which interfere with the virtuous propensities, and, consequently, with the due increase of the human race. When, therefore, we consider the probable inaccuracy of the facts upon which this branch of the argument rests, the modifications they receive, from those causes which the principle explained itself requires, as well as from others extraneous to it, and, above all, their paucity; we shall be prepared for a degree of obscurity which will not, however, attend the future and more important steps of the demonstration. Here, only, in the absence of more certain information, we must often depend upon the not unsatisfactory evidence of general observation and assent.

(5) If, then, we commence with the lowest gradation in the scale of population, when in a state of civilization, and ascend to the highest, where similar habits prevail, and, moreover, where the climate and rate of mortality are not, perhaps, materially dissimilar,

inserting in their proper positions those other countries with whose state of prolificness we have been made at all acquainted, and which, also, are nearly equal in other respects, we shall have the proof now under consideration as fully before us as our present limited information admits; which we cannot, however, anticipate should exhibit arithmetical precision, no two countries being perhaps alike as to those circumstances, which, as before explained, influence the final result. While, therefore, in this part of the inquiry, we may expect to find general indications of the theory in question, still it would be subversive of it not to meet with them accompanied by such variations as its very principle demands; which variations cannot, as in many other cases, be rectified by forming them into general averages, the instances being far too limited in number to admit of such a method.

(6) The two extremes of the argument, then, I take to be New Holland, as the most thinly, and the mother country, England, as the most densely, populated countries, where the circumstances which affect the question, as before expounded, are sufficiently similar. As to the former, no dispute can be raised; and, regarding England, it is unquestionably the most densely peopled of any considerable country upon earth, excepting the kingdom of the Netherlands, which only just exceeds it in that respect; and which I reserve for distinct consideration, as one of those exceptions to the general rule which, it will be found, proves and exemplifies the entire system and principle at issue.

(7) As to New Holland, it would be more curious than necessary to the argument, to trace the progress of the colonial population there from its first establishment to the present time, were I in possession of the facts necessary for the attempt; which, however, I do

not believe exist. It will fully suffice to shew its surprising increase, for a few years only, in the five principal settlements there, which I give on the authority of Mr. Oxley, whose work now lies before me[1]. It is as follows.

TABLE LIX.

EXHIBITING THE INCREASE, FOR THREE SUCCESSIVE YEARS, IN THE FIVE PRINCIPAL SETTLEMENTS OF NEW SOUTH WALES.

Years.	Sydney.	Paramatta	Windsor.	Liverpool.	Newcastle.	Total.	Annual Increase per Cent.
1815	5668	2566	2749	1167	346	12.911	18
1816	6882	3581	3164	1550	413	15.175	18
1817	7409	4257	4257	1922	553	17.265	14

(8) From these numbers there must, of course, be deducted the convicts and emigrants which were added to the population during these three years, over and above those which had returned to Europe within that period; but still, after these rectifications, the increase which took place from procreation only must have been without parallel in the European or American world. And this increase is the more wonderful when it is recollected that the convicts are, from a policy of the most mistaken kind, almost exclusively males; a circumstance which, were we to give heed to certain authorities on the subject of population, is fatal to the increase of incomers even in America, where there is the reverse of a paucity of single females at the marrying age; but here, where that scantiness exists to a most lamentable degree, and is constantly increased, as before observed, it forms, one would have thought,

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[1] Oxley, Journal of Two Expeditions into New South Wales, p. 392.

an insurmountable obstacle to the growth of population. Such, however, is not the case; the astonishing fecundity of marriages more than counterbalances the effects of that deficiency; and the growth of the population, even under circumstances so disadvantageous, is probably greater than in any other country upon earth.

(9) No registers, it is true, exist, by which the fact now under notice can be numerically substantiated; but its reality rests upon quite as satisfactory a foundation, namely, the unanimous declarations of all who have witnessed the circumstance and have adverted to it. Amongst these, Hunter, as quoted by Malte-Brun, states New Holland to be very favourable to generation[1]. Another early writer on that country, the notorious Barrington, observes, that such is the force of the principle of population there, that, contrary to what is the known case in the Old World, the very prostitutes are prolific[2]. Wentworth, a later writer, has adverted to the fact of the "amazing fecundity of the colonists" there[3]; and Dr. Reid, the last authority I shall quote, declares the natural increase to be "unquestionably without parallel, even in the records of American colonization[4]." It is unnecessary to multiply proofs when authorities are unanimous.

(10) But should it be objected that this extraordinary fecundity is developed in consequence of the absence of those checks which, it is argued, uniformly keep down the population in more crowded districts and countries; in contradiction to such an assertion, I need only refer the reader to the history

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[1] Hunter, on the Origin, &c., p. 375.

[2] Barrington, History of New South Wales, vol. ii., p. 512.

[3] Wentworth, New South Wales, p. 184.

[4] Dr. Reid, Two Voyages to New South Wales, p. 304.

of that colony from its commencement even to the present moment; and he will be abundantly satisfied on this head. Those checks, as has been already observed, are always active in proportion to the paucity of the population; they operate with peculiar severity in the early periods of colonization, and have been strikingly prevalent, at intervals, during the entire period of our Australasian plantation.

(11) Leaving this infant country, which, commencing, like Rome, as a refuge of thieves and robbers, shall, if God see fit to give duration to the world, at length infinitely surpass that Rome in the proudest periods of her story, when the principle for which I contend, as one of universal good, shall have rapidly spread " a brave new world with goodly creatures;" perpetuating the language, literature, and institutions of their forefathers, and raising the standard of freedom, religion, and civilization in the enslaved and degenerate East; in a word, when what has been emphatically pronounced not only " the richest soil[1]," but " the most delightful country of the globe[2]," shall be replenished with population, and beautified with culture,—let us now advert to a nearer continent, where we shall see the principle of population further proved and illustrated.

(12) The colony of the Cape of Good Hope is also exceeding thinly peopled, there being not quite one individual on the square mile[3], including the aboriginal inhabitants. The increase of the colony, according to censuses commencing with the peace, and including all the different races, has been as follows:

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[1] Oxley, vol. i., p. 177.

[2] Colebrook, Journ. of Voyages, p. 121.

[3] Malte-Brun, tom. lxx., p. 361.

1814	84,069
1819	99,026
1821	116,044
1822	120,000

Exhibiting, therefore, an augmentation of 43 per cent. in eight years[1]! Much of this has, doubtless, been occasioned by emigration, and, I fear, a part by less creditable means. To advert, then, to another document, where the whites are discriminated; the increase of these, together with other circumstances connected with the subject, have been as follows:

TABLE LX.

EXHIBITING THE INCREASE &c., OF THE WHITE POPULATION AT THE CAPE OF GOOD HOPE, FROM 1813 TO 1820 INCLUSIVE.

Years.	Male Population.	Female Population.	Male Births.	Female Births.	Male Deaths.	Female Deaths.	Total Births.	Proportion of Births to Females, 1 to
1813	17,714	14,154	686	706	292	177	1392	10.4
1814	18,019	16,814	802	825	242	238	1627	
1815	19,081	18,183	888	894	287	193	1782	
1816	19,578	18,416	805	892	305	207	1697	
1817	20,750	18,884	918	927	320	227	1845	11.5
1818	21,772	19,620	814	832	340	247	1646	
1819	22,046	20,171	810	815	340	224	1625	
1820	24,592	20,505	881	898	375	264	1779	
			6604	6789	2501	1777	13,393	10.9

(13) Previously to making the intended use of the

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[1] Malte-Brun, tom. lxx., p. 361.

[2] Asiatic Journal, July, 1826, p. 64.

foregoing table, I will repeat that it is not attempted to be denied, that a part of the increase apparent on the face of this census has resulted from foreign accessions; but it is obvious, as well from the nature of the case as from the evidence of the document itself, that this has been far less the fact in the female than in the male part of the population; and it may be presumed, also, that when females emigrate, they are accompanied by a fair proportion of the other sex, as well as infants; and consequently, as it respects such additions, the relative proportions in the other movements of the population will be preserved. Adverting, then, to the column of females, we find that in seven years there was an increase of nearly 45 per cent.; or, if we reject this calculation on the gross amounts, and only add to the first year of the term the difference between the births and the deaths of that sex during the remainder of it, (a mode of computation which will almost invariably lead to an error of deficiency, and which necessarily excludes accessions from emigration,) we shall find that the accumulation during that period will amount to 5012 upon 14,154, or above 35 per cent. Either of these results is wholly unprecedented in Europe, or even in America; in the least populated countries of which, the inhabitants are far more numerous on the same space. But, to present the argument in a less exceptionable form: on referring to the births during the term in question, we shall find them averaging 1 in 10.9, calculated on the whole of the female population;—a proportion which, I again venture to state, will be found higher than any that obtains in Europe or America. In the State of New York that proportion is 1 in 13.2; in England 1 in 17.3. It is unnecessary to pursue the contrast into other countries, where, however, it will, on examination, be found to exist, though in different degrees.

(14) Were the registers of the Cape of Good Hope collected and published, there can be no doubt that the preceding arguments would be still further confirmed by more direct proofs. But we can approach even these by a not very circuitous or uncertain method. Supposing the annual marriages at the Cape to have been as numerous as 1 in every 60 existing females, (in the State of New York I see the proportion was, in 1820, 1 in 68 only,) then there would have been, during the period in question, 305.7 annual marriages, and 1674 annual births: giving 5.48 as the average prolificness of marriages, calculated by the usual method, during that term.

(15) Nothing, then, is more clear than the extraordinary prolificness of human beings in this scantily peopled part of the world, nor does the fact rest upon mere statistical data, it has been long notorious to common observation: Lichtenstein, for instance, says, that it is so great as to make it "very moderate to reckon ten children to a family[1]." Nor can it be argued, that the principle of increase has not been there as much exposed to the "direct checks," as they are called, as in any district upon earth, which has not been actually desolated: speaking even of late years, more than once invaded and conquered; subject to the murderous incursions of the surrounding savages; placed on the very verge of famine; and suffering, during the whole period at least, as full a measure of difficulty and distress as the mother country: still its population has increased in the wonderfully rapid manner we

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[1] Lichtenstein, p. 113. Salt remarks also the great mortality which occurs during infancy at the Cape—a circumstance, which as connected with the one above mentioned, strictly conforms to a principle laid down in this treatise. Salt, Travels, &c., p. 9.

have seen. When it shall have still further advanced, till it has replenished that extensive peninsula with inhabitants, and subdued it by culture, and consequently meliorated the climate, as well as improved the condition of the people, the principle of increase will then, as it has ever done, contract, so as to limit the future numbers of the species by the full measure of their happiness and prosperity.

(16) With regard to the opposite continent, America, all we know fully confirms the principle at issue. The direct proofs, indeed, especially as it regards the southern division of that country, are scanty; but, as far as they go, they are uniform and conclusive. As to the great eastern portion of the latter, the Brazils, the scanty population of which, either in reference to space or fertility, is so notorious, we are informed that "the women are very fruitful[1];" a fact which has received a stronger confirmation than mere observation can afford. Malte-Brun observes, of a series of official reports, relative to one part of the country, that the proportion of the births is remarkable; the ratio being as one to twenty-one individuals[2]! In the Spanish territories, the researches of the celebrated Humboldt establish the same fact, as it respects those very inadequately peopled regions. He presents us, indeed, with some very surprising instances of increase amongst the missions of Peritu[3]; but, as he does not inform us whether the population, in the places to which he refers, is composed of the different sexes and ages in their natural proportions, or constantly receiving accessions of adults, no very certain conclusions can be drawn from the facts he

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[1] Smollett's Voyages, quoted by Dr. Short, p. 184.

[2] Malte-Brun, Géog., l. xci., p. 585.

[3] Humboldt, Personal Narrative, vol. v., p. 34.

has recorded, further than this; that the prolificness of the females must, under any circumstances whatsoever, be very great. His observation upon the subject is too important, as well as applicable, to the entire argument, to be omitted. "We observe," says he, "generally, every where on the globe, that "the population augments with a prodigious rapidity "in countries thinly inhabited, with an eminently "fertile soil, and equal temperature[1]." This remark, however meant to be applied, is fully confirmatory of my position; and, on the other hand, the same author again answers, from his own observation, the only objection that can be advanced against so irrefragable a proof, namely, that this great and rapid increase is the consequence of abundance. On the contrary, I will venture to pronounce, that every "check" which has been enumerated, as keeping down population to the level of subsistence, as it is expressed, including the darkest "positive" ones, infanticide and famine, is the more busily at work, the more fruitful the country and the scantier the population. Regarding the first of these, we are informed, on the same authority, "that the Indian kills his son to avoid a little inconvenience[2];" and, as it respects the latter, he says, as I think has been before quoted, "where the beneficent hand of Nature seems "every where to have scattered the germ of abun- "dance, man, careless and phlegmatic, experiences "periodically a want of nourishment, which the "industry of more civilized nations banishes from the "more sterile regions of the north[3]." What, then, it may be asked, can develop the resources of Nature in such vast and fertile regions, and elevate their inhabitants to the natural dignity of human beings, but that necessity which increasing numbers can alone create? or, in other words, what, but that unchecked principle of population which the sophists of the day have dared to pronounce an evil?

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[1] Humboldt, Personal Narrative, vol. i., p. 106.

[2] Ibid., vol. v., p. 30.

[3] Ibid., vol. i., p. 123.

(17) It is surely unnecessary for me to say any thing in proof of the prolificness of North American marriages; that topic may be left to the supporters of the theory of human superfecundity, on which, as affording them, as they suppose, their demonstration, they have largely expatiated. And without entertaining the wild, and indeed impossible, suppositions of Dr. Franklin, Mr. Warden, Mr. Malthus, and others, respecting the proportion of the marriages to the population, and, occasionally, that of the births to the marriages, it would be as inconsistent with my argument as with truth itself, to deny that both are large. If the prolificness of marriages throughout the United States may be supposed similar to that which takes place in the State of New York, and if a document I now refer to is correct, it rises to as high a proportion as $5\frac{22}{100}$ births to every wedding[1]. Still that the Americans have not been exempted from "hard times," as Dr. Franklin called them, in any part of their history, we are fully assured; and even Mr. Malthus has lately argued, that the condition of the labouring classes of society there, (the vast mass in America,) cannot be so much better than that of the labourers of other countries, "as the relative quantity of food they earn might seem to indicate[2]:" nay, the authority he quotes seems to express the very reverse on a comparison with those of this country[3]. As to the preventive check, if we are to credit the document already alluded to, it appears to prevail considerably more in the

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[1] Bull. Univers., Géog. et Statist., t. vii., p. 198.

[2] Malthus, Essay on Population, vol. ii., p. 122.

[3] Simond, Travels in England, Ed. vi.

United States, at least in the State of New York, than in England; 1 in 139 being the proportion of the marriages in the former, and 1 in 123 in the latter.

(18) Concerning Canada, I have not been able to obtain any available documents; I believe, however, universal observation verifies the assertion of the celebrated modern geographer, Malte-Brun, that "the Canadians are seldom without a numerous offspring[1]."

(19) I proceed now to advert to the prolificness of various countries of Europe in reference to the principle under consideration, but keeping within the limitations already laid down, namely, a climate and soil favourable to human existence. And, first, Russia in Europe appears to be the most thinly peopled of any region in this quarter of the world, where civilization prevails, and where the country is fertile and favourable to life. The number of inhabitants on the square mile, as computed at present, is short of 25. Here, then, the law of Nature for which I contend ought to manifest itself unequivocally if it exist. The registers of that country have, indeed, till of late, been utterly worthless, exhibiting proportions which it would be insulting to the most credulous reader to present seriously to his consideration; still it is a fact which has always been well known, that the marriages there are very prolific, especially in proportion to the mortality, which is as remarkably small. The declaration of the Empress Catherine, in her instructions concerning a new code of laws, that the "peasants for the most part had twelve, fifteen, and "even as far as twenty children to one marriage," may be allowed to be a great exaggeration, but it is one which must rest upon a very great degree of fertility.

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[1] Malte-Brun, Géog., l. lxxviii., p. 130.

This fact has been recently proved; the last census of that empire, which, perhaps, is the only statistical document of this nature that can be fully relied upon, gives us the following results. In the Greek communion, comprising 40,351,000 souls, the marriages were, in 1820, 317,805, or about 1 marriage in every 126 individuals: arguing, it is true, no peculiar exemption from the preventive check, but, on the other hand, proving that the weddings are not more numerous, and cannot, therefore, be contracted earlier, than in England, where in that year they were as 1 to 122, and the deaths in a much smaller proportion than in Russia[1]; still further proving, that if the "preventive check" prevails at all, it prevails more in the latter than in the former country. But the proportion of births to marriages was 4.94 to 1, a prolificness only to be accounted for on the principle for which I am contending.

(20) It may not be easy, in conformity with the principles already laid down, to class very accurately many of the other countries of Europe; several of them being, probably, according to their means of subsistence, pretty equally peopled. I shall proceed, however, with the attempt; and, in doing so, I shall take my proofs chiefly from a preceding generation, not only with a view to avoid those disturbances in the proportions in question since occasioned by the long and universal war, which must have caused considerable variations in the relative fecundity of marriages, as is elsewhere fully shewn, but likewise preparatory to another branch of the argument, in which the past and present prolificness of marriages in the same countries will be compared.

(21) The registers of Denmark, as quoted by Suss-

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[1] Malthus, Essay on Population, vol. i., p. 318, 6th Edition.

milch, taken from the years 1769 to 1774, give, on an average, 4.89 children to each marriage[1]. A subsequent term, however, exhibits a different result; but in so remarkable a degree as to warrant me in venturing to pronounce it incorrect.

(22) Prussia, on the same indefatigable authority, from the year 1756 to 1784, gave about 4.7 children to each wedding[1], as will be seen by a table that will be subsequently given[2].

(23) In France, the proportion of births to marriages, in the years 1781 and 1782, was, according to Condorcet and La Place, as 4.22 to 1.[3] And here I must in fairness remark, that though this country seems to class itself in reference to mere numbers precisely where it should do, yet I cannot but think that its fecundity ought to have appeared higher, both then and at present; as, although its population, in proportion to its extent, appears larger than that of many of the neighbouring nations, yet it seems to be smaller, considering its almost unrivalled means of subsistence, were they adequately developed; so vast a part of its soil being, if properly cultured, highly productive. The reason of this, however, is not very obscure: the natural prolificness of marriages in that fine, but not fortunate country, owing to the murderous and ambitious wars of its rulers, on the one hand, and still more, perhaps, to the vicious habits of the population on the other, has, doubtless, been interrupted and diminished, and the prosperity of that favoured region, notwithstanding the many confident assertions to the contrary, thereby greatly impeded.

(24) I am not aware of any other countries that

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[1] Sussmilch, Gottliche Ordnung., th. iii. Tab., p. 64.

[2] Ibid., p. 63.

[3] Sussmilch, Gottliche Ordnung, th. iii., p. 66.

come within the limits of the general proposition, of which properly authenticated registers have been published, with the exception of England and the kingdom of the Netherlands. Regarding the latter, which some have imagined to be an instance in direct contradiction to the principle advanced, I reserve it for distinct and particular consideration; when it will be found to be an exception indeed, but precisely one of that nature which, while it exemplifies the modifications already advanced, fully confirms the general rule as an invariable law of Nature. As to England, in which, about the time generally referred to, there were 160 inhabitants on the square mile, the prolificness of marriages was $3\frac{56}{100}$ children each[1].

(25) The following table will present, at one view, the results distributed through this chapter.

TABLE LXI.

EXHIBITING THE COMPARATIVE PROLIFICNESS OF MARRIAGES, AS REGULATED BY THE DENSITY OF THE POPULATION, IN THE COUNTRIES SPECIFIED, AND AT NEARLY THE SAME PERIOD.

Countries.	Inhabitants on a square mile, about	Children to a Marriage.
Cape of Good Hope	1	5.48
North America ..	4	5.22
Russia in Europe .	23	4.94
Denmark	73	4.89
Prussia	100	4.70
France	140	4.22
England	160	3.66

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[1] Rickman, Prelim. Obs. to the Population Abstract of 1821, p. xxviii.

(26) Striking as is the proof this table seems to exhibit of the truth of the main position advanced in this treatise; still, aware, as I fully am, of the great uncertainty and comparative incorrectness of which it may not be unreasonably suspected, and of those other constantly operating causes already pointed out, which would vary the results, were they ever so accurately given, I will lay no farther stress upon this branch of the argument; but proceed to a species of proof, as to the principle in question, not liable to such objections. Previously, however, to doing this, it may be proper to give a few exemplifications of the modifications in this law of Nature, as occasioned by some of the most important of those circumstances already particularized.

CHAPTER VII.

OF THE LAW OF POPULATION: ITS APPARENT EXCEPTIONS STATED, AND PROVED TO BE CONFORMABLE TO ITS PRIMARY PRINCIPLE AND DESIGN.

1) It has been already observed, that the prolificness of human beings is not only regulated by the extent of space they possess in proportion to their numbers, but also by the nature and quality of that space; so that, under all its modifications, the law of population, having thus a direct reference to the means of sustentation, vindicates its character as a principle of universal benevolence. Thus, on leaving the temperate regions and approaching the polar ones, as the climate becomes severer and less favourable to vegetation, and, consequently, more unfriendly to the preservation of mankind, there the principle of human increase visibly contracts. Again, as far as my remarks have extended, it is an equally true, and still more striking fact, that the more mountainous is any country, the less prolific are its inhabitants. These circumstances, together with that of the inverse proportions of human fecundity and longevity, constitute those modifications of the general law of population, which, as variously operating, not only in different countries, but in different divisions of the same country, may seem to give a degree of complexity and uncertainty to the calculations which are to establish the principle; they nevertheless exhibit the simplicity and unity of its design in a far more striking point of view. It determines that the family of Nature is small or great, and, therefore, that there is room for their increase, or otherwise,

by a reference to the possible means of sustentation provided for them; and consequently presents the question, as governed by those plain principles of common sense which ultimately decide every other subject.

(2) First, then, as it respects the diminution of human fecundity in the severe climates and sterile regions of the north. I shall not claim Sweden as a very striking proof of this fact, as I am persuaded the disadvantages under which it labours, in both respects, are removable, in a great degree, by human industry: at present, however, I cannot doubt but that they operate partially in a considerable part of that country, containing, as it does, within itself so wide a difference in surface and climate as to occasion, probably, material deviations from the general rule, had we the facts necessary to determine this point. From, however, the years 1749 to 1763, inclusive, there were celebrated in Sweden 315,502 marriages: the births, during the same period, amounting to 1,312,255, it follows that the fecundity of each was as 4.16 to 1.[1]

(3) In the northern division, however, of the Cimbric Chersonese, the principle, if true, must be found to apply; and such proves to be the case. The Laplanders, we are assured by their celebrated historian Shefferius, are unfruitful[2].

(4) As to the Icelanders, whose climate and the general sterility of whose soil are too well known to render it necessary to do more than merely advert to them, we are informed, on the authority of Malte-Brun, that their offspring are not numerous[3].

(5) Lastly, respecting the Greenlanders, who inhabit one of the least propitious countries in the world, we are assured, on the very best authority, namely, that of Crantz, that they are the reverse of prolific: so

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[1] Wargentin, K. V. ac Handl., 1766.

[2] Shefferius, Lapland, p. 120.

[3] Malte-Brun, l. lxxvii., p. 106.

much so, indeed, that when told of the fruitfulness of the Europeans, it seemed to excite in them feelings of contempt, as something unnatural; and they compared them, he tells us, in this respect, to their dogs. Meantime, Nature appears to accomplish its purpose, that of limiting human increase where the means of providing for it are so scanty, without the particular interference of the checks. Their fondness for their children is extreme, and their care for them as exemplary; and few of either them or their mothers are lost in parturition. Still population, on the whole, very slowly, if at all, increases in this inhospitable region: indeed it is thought that, in certain parts, it has entirely disappeared.

(6) With these data before us, we must conclude that the increase in the inhabitants of countries bordering upon, or within, the arctic regions, if it exists at all, is very slow. The only document which I have seen, in reference to any of them, are the censuses of Iceland, and these will abundantly suffice to prove the whole of the foregoing facts and deductions: they comprehend a period of more than a century, and are as follows:

In 1703 . . .	50,444
1809 . . .	48,063
1822 . . .	48,386
at present . . .	49,269

The population in that island, therefore, scarcely maintains its numbers, though, judging from a solitary register in Sussmilch's tables, the marriages were to the population as 1 in 123; arguing, therefore, a very general exemption from the preventive check, the absence of which the then unusually small mortality of 1 in 42 renders still more conspicuous[1].

(7) Next, it has to be explained, that in moun-

[1] Sussmilch, Gott. Ordnung., th. iii., tab. p. 64.

tainous and sterile districts human beings are less prolific than in champaign ones. This is a distinction, however, which, in reference to the main principle advanced, does not, when duly considered, involve an essential difference. It is very clear that, where the surface of a country is, in any considerable degree, taken up by uninhabitable mountains and barren hills, its population may, in the cultivated parts, be in reality far more crowded than a larger number of inhabitants in a country of the same extent, but more generally fertile, and where the people are consequently more evenly distributed. Whatever be the causes, whether physical or moral, which regulate the fecundity of human beings by their numbers on a given space, they must operate in reference to the extent actually, and not politically, occupied.

(8) There are but few districts in the temperate regions, concerning which we possess the necessary information, that exhibit these striking contrasts. Two only occur to me at present; the one is Wales, whose surface is in a high degree mountainous, compared with England; and, therefore, in full conformity with the principle advanced, we find the prolificness of marriages in the latter country, as calculated on the ten years preceding the last census, to be 3.59[1] to one; whereas that of Wales, during the same period, was only 3.29 to one: a difference of nearly 10 per cent.[2] In Switzerland, if we may transfer the calculations of the indefatigable Muret respecting his own canton, Vaud, to the whole Confederation, the prolificness of marriages was considerably less than in France at the same period[3]. Agreeably to this result it has long

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[1] Abstracts, Parish Registers, 1821, pp. 145 and 153.

[2] Ibid., p. 153.

[3] Muret, Mémoires de la Soc. Econ. de Berne, 1766, p. 2.

been stated that Switzerland is better peopled, in reference to its labourable soil, though not its actual extent, than France.

(9) The last point of consideration in this branch of the argument is the correspondence of the law of mortality to that of fecundity, and the visible adaptation of the latter to the former; a fact not only of a most curious nature in itself, but of the utmost importance to the moral demonstration of the theory of population for which I contend: nor is there one regulation in reference to this theory which, in the great plurality of cases, and under every variety of circumstances, operates with more universality and certainty. And first, it manifests itself as it respects entire countries when relatively examined. For instance, the kingdom of Naples, compared with that of France, is not very dissimilarly peopled. In the former, however, the deaths to the population are nearly as high as 1 in 31, taking an average of the mortality of the years 1822, 1823, and 1824, and calculating on the population of the middle period[1]. The deaths of France, however, were not, during those years, 1 in 40[2]: a prodigious difference; but the proportion of births to marriages, which was in the latter country only 3.94 to 1[3], rose as high in the former as 4.86 to 1[4]. It would be idle to object that in Naples the marriages were more early than in France, or that they were more numerous: the reverse in both instances will turn out to be the fact, if the calculation be made on the correct principle already sufficiently explained.

(10) The same curious fact holds good likewise as it respects the different districts of one and the same

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[1] Giorn. del Reg. delle due Sicilie, Juil. 1825.

[2] Annuaire, 1827, pp. 100, 101.

[3] Giorn. del Regno delle due Sicilie, Juil. 1825.

[4] Annuaire, 1827, p. 101.

country, where the proportion of mortality greatly varies; of which, again, only one example shall be given, and in the words of the celebrated writer on the statistics of the Pays-Bas, M. Quetelet: "It is remark-"able," he says, "after the observations of ten years, "that the mortality should be nearly in accordance "with the number of births; thus Zealand produces "incomparably the most children of any province of "the kingdom; it reckons also incomparably the most "deaths, other things equal. It is the same with "both the provinces of Holland. Namur has, on the "contrary, the fewest deaths, and this province also "ranks itself amongst those which have the fewest "births[1]." The author declines searching for the physical causes of this relation, which, however, are often resolved, by the theorists I am opposing, in a manner wholly inconsistent with reality and truth. The just explanation will be found given by Muret in his Essay on the Population of the Pays de Vaud; though it is one at which Mr. Malthus has not very becomingly sneered, because it unnecessarily, as he thinks, appeals to the providence of the Deity[2]. M. Muret asks, after he has exemplified the fact to which I have been just adverting, "Is it not that, in order to "maintain in all places the proper equilibrium of po-"pulation, God has wisely ordained things in such a "manner, so that the force of life in each country "should be in the inverse ratio of its fecundity[3]." Had he proceeded in his enquiries, and discovered that there is still a far more important regulator of the principle of prolificness than mortality, and one which is the most plainly and powerfully operative when that mortality is equal, he would have comprehended the real principle of population: as far as he went, however, he is the only writer, of whom I have any knowledge, that had the remotest idea of any part of it.

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[1] Quetelet, Recherches Statistiques sur Pays-Bas, p. 49.

[2] Malthus, Essay on Population, p. 272.

[3] Memoires, &c., par la Soc. Écon. de Berne, 1766, 1re partie, p. 48, &c.

(11) But there is another and a still more decisive proof that mortality has an influence on fecundity, in the fact that, even in the same countries and districts, mortal years are, on the average, invariably more fruitful in conceptions than healthful ones, other things, and particularly the number of existing marriages, remaining the same. But this part of the argument, so important in all points of view, especially as an answer to many of the suppositions of those who espouse the theory of human superfecundity, has been fully discussed in another part of this work.

(12) Lastly, this law of Nature operates individually. The families in which there are the most victims to mortality, are those in which there is, on the average, the greatest degree of fecundity; and more especially, if there be any hereditary taint threatening life, as in the case of struma, for instance[1]. Under these circumstances, it is a fact that has been so long familiarly known to the medical profession, that the parent is endowed with a higher measure of fertility, that the excess has been even made a matter of calculation.

(13) I shall now conclude this part of my subject, without pretending that I have exhausted it. On the contrary, I have omitted several minor causes, which, I conceive, have a direct influence on the regulation of the general law of fecundity; more still, perhaps, have wholly escaped my observation. In the mean time, however, enough has been already advanced, it is hoped, to incline the least credulous mind to believe,

[1] Jarrold, Dissertations on Man, p. 303.

that Nature has regulated the numbers of her offspring, and especially those of human beings, by the means of subsistence which she has prepared for them; varying their prolificness, therefore, so as to accomplish that purpose under every variety of circumstances in which they may be placed.

(14) I shall close these remarks by one which I wish to be understood as prefatory to the ensuing chapters, at least to those of them in which the numerical proofs of the principle enunciated is pursued: it is this; that, owing to these great variations in the circumstances and situation not only of different countries, but in the several districts of the same country, (which differences affect the degree of prolificness agreeably to the principles laid down,) in establishing any general conclusions, it is obviously and essentially necessary that a sufficient number of instances should be taken, in order to afford a fair presumption that the deviations from the general rule, so occasioned, should balance each other; to say nothing of the necessity of so doing, in order to compensate for those inaccuracies which are of perpetual occurrence in all statistical documents, and which would be often fatal to the truth of any deductions founded on particular cases. Doubtless, if we had correct results in each individual instance, and were accurately informed regarding all the circumstances attending it, we might, if sufficiently acquainted with the laws of Nature, draw conclusions minutely and mathematically correct, from every separate fact: such, however, is not, nor probably ever will be, the case; hence the necessity of taking a sufficient number of facts whereon to ground any general principles. A near view of Nature, even in the simplest and most certain of her works, will indeed serve to convince

us that she is perpetually accomplishing her purposes by means the most varied and complicated, and that it is only in the general results that the uniformity of her operations becomes manifest. It is thus that she educes the most perfect harmony from an infinite variety of apparently discordant elements, and seems studiously to conceal, if not even to confuse those means by which she accomplishes her purposes, with a certainty, a regularity, and a precision, to which there is nothing corresponding in the most exact and elaborate of human calculations. Her works exhibit an inexhaustible variety, excluding perhaps all precise repetition, and yet they manifest through their several orders, a striking, though indefinite conformity. The observation of this fact, probably suggested to the ancient philosophers, particularly to Plato, the idea of that model existing in the Divine mind, according to which they conceived all things to be formed. Thus is it, I repeat, that Nature, abhorring minute exactnesses, glories in hiding her means, at the very moment she is accomplishing her designs. Every variation, however, could we penetrate her arcana, is doubtless dictated by laws as definite in their principle, and as certain in their effects, as those by which she governs and maintains the planetary system. To apply, then, these remarks to the subject immediately before us, nothing can be less certain on any matters regarding population than conclusions founded upon individual instances; yet, as it has been long ago observed, and will, it is hoped, be further proved in the course of this work, nothing can be more sure than the deductions drawn from a sufficient number of them; or, to express this important truth in the words of Dr. Dugald Stewart,—" How " accidental soever," says that celebrated writer, "these circumstances may appear, and how much "soever they may be placed, when individually con-"sidered, beyond the reach of our calculations, expe-"rience shews they are, somehow or other, mutually "adjusted, so as to produce a certain degree of uni-"formity in the result; and this uniformity is the "more complete, the greater is the number of circum-"stances combined. What can be more uncertain "than the proportion between the sexes among chil-"dren of the same family, and yet how wonderfully is "the balance preserved in the case of a numerous "society? What more precarious than the life of an "individual? and yet, in a long list of persons in the "same age, and placed in the same circumstances, "the mean duration of life is found to vary within "very narrow limits." After enumerating a variety of instances, in proof of this view of the subject, he adds, that the difference, arising from causes however various, acquires a kind of uniformity, when collectively considered, and especially in the immense extent of an entire kingdom.

(15) Whoever, therefore, would determine any points relative to the important subject under consideration, whether in contradiction or confirmation of this or any other principle of human increase, must bear in mind, that no satisfactory conclusions can be drawn from single and unconnected facts, whether relating to individuals, or even to particular districts of an entire country.

CHAPTER VIII.

OF THE LAW OF POPULATION, AS PROVED BY THE CENSUSES OF ENGLAND.

(1) I PROCEED to a farther and more certain demonstration that the prolificness of human beings is regulated, as previously propounded, by a comparison of their fecundity in different divisions of the same countries, according to the inequalities of the population.

(2) The great advantage of pursuing this branch of the argument into particulars, is, that it will at once divest it of much of that uncertainty which must, in the nature of things, attach to it while resting upon a comparison between different countries, in which it cannot be supposed the necessary facts are obtained in the same manner, or given with equal accuracy; and which, moreover, are influenced by those local circumstances, moral and physical, which, as before stated, affect the general results. But, in comparing the different districts of the same country, we may conclude that a like degree of accuracy will probably be found in the national registers, which, if deficient, it may be presumed, will be so throughout, and in tolerably equal proportions; and also that the other circumstances affecting the question will be more nearly similar. Still, however, those circumstances exist in various degrees, even in one and the same country; and, together with other causes which I shall not attempt to develop or enumerate, must prepare us, if truth be our object in this enquiry, to seek for it in other than strict arithmetical proportions. For myself, I cannot refrain expressing my surprise that, in prose-

cuting this demonstration, it has presented itself so nearly in that form; many individual inequalities may indeed be observed, but these are generally, if not constantly, balanced on the average of the whole number.

(3) I shall now, therefore, submit the principle of population to this very rigid test; one, however, which seems necessary to its complete establishment. And first, that the prolificness of marriages is inversely as the condensation of the population, I prove by an appeal to the censuses of England, and I take all the facts from the last one, and cannot, therefore, be accused of either selecting or garbling them. I divide the counties thus: first, those in which there are less than 100 inhabitants in the square mile; second, those in which there are from 100 to 150; third, those in which there are from 150 to 200; fourth, those in which there are from 200 to 250; fifth, those in which there are from 250 to 300; sixth, those in which there are from 300 to 350; seventh, those in which there are from 500 to 600; and lastly, that in which there are upwards of 4000. None, I think, will assert that this division is not sufficiently minute, and few perhaps who will suppose that the principle at issue can sustain so exact an ordeal. The marriages and births, according to this classification, are next given; and, in order to obviate, by anticipation, those objections which might be suggested by the contrary theory, the deaths also. The totals of the last ten years have been taken throughout, and the annual proportions of the marriages, births, and deaths, calculated on the mean number of the inhabitants in each county in 1811 and 1821, as stated in the published accounts. I have, lastly, given the omissions of marriages, births, and deaths, as enumerated in the abstracts, according to which those proportions are rectified. The following table exhibits the results:

TABLE

DEMONSTRATING THE LAW OF POPULATION BY THE CENSUS OF
IN THE SEVERAL COUNTIES IS REGULATED

COUNTIES.	Population on a Square Mile.	Population in 1821.	Square Miles in each County.	Number of Marriages from 1810 to 1820.	Number of Baptisms from 1810 to 1820.	Proportion of Births to 100 Marriages.
Westmoreland	68	52,400	763	3,385	14,888	
York, North Riding.	91	187,400	2048	12,422	51,546	
Under 100 *on the square mile.*				15,807	66,434	420
Lincoln...........	105	288,800	2748	20,892	87,620	
Cumberland	107	159,300	1478	10,299	45,085	
Northumberland....	108	203,000	1871	12,997	45,871	
Hereford..........	122	105,300	860	6,202	27,909	
Rutland	127	18,900	149	1,286	5,125	
Huntingdon	134	49,800	370	3,766	13,633	
Cambridge	145	124,400	858	9,894	37,491	
Monmouth	145	72,300	498	4,586	13,411	
Dorset............	146	147,400	1005	9,554	39,060	
From 100 *to* 150.				79,476	315,205	396
York, East Riding..	151	194,300	1280	15,313	55,606	
Salop	156	210,300	1341	13,613	58,542	
Sussex	162	237,700	1463	15,779	68,708	
Northampton	163	165,800	1017	12,346	42,336	
Wilts.............	164	226,600	1379	15,654	58,845	
Norfolk...........	168	351,300	2092	25,752	102,259	
Devon.............	173	447,900	2579	35,264	130,758	
Southampton	177	289,000	1628	24,561	88,170	
Berks	178	134,700	756	9,301	38,841	
Suffolk	182	276,000	1512	19,885	76,327	
Bedford	184	85,400	463	6,536	22,871	

LXII.

ENGLAND, SHEWING THAT THE PROLIFICNESS OF MARRIAGES BY THEIR COMPARATIVE POPULATION.

Deaths from 1810 to 1820.	Mean Populat. 1811—1821.	PROPORTIONS.			ADDITIONS OF UNENTERED.			PROPORTIONS.			
		Births, 1 to	Deaths, 1 to	Marriages, 1 to	Marriages.	Births.	Deaths.	Births, to 100 Margs.	Births, 1 to	Deaths, 1 to	Margs. 1 to
9,058	49,950					80	20				
29,432	179,250				10	1030	100				
38,490	229,200	34	59	145	10	1110	120	427	33	59	144
46,373	267,350					1370	350				
27,161	148,800				70	2180	380				
30,380	190,450				1030	6860	4670				
16,748	101,300				10	170	70				
2,991	17,950					190	50				
7,901	46,750					640	220				
21,175	114,450					1180	370				
9,380	68,250				110	2030	900				
21,867	138,150				10	1910	360				
183,976	1,093,450	34	59	137	1230	16,530	7370	414	33	57	135
33,644	183,650				40	2670	430				
35,923	205,550					1140	370				
32,805	217,100				10	2430	360				
27,827	155,950				10	3270	940				
33,989	213,450					2040	550				
56,642	326,550				30	4210	490				
72,137	422,000				10	7630	1170				
49,118	271,150				90	2100	310				
23,058	128,500					610	250				
40,543	269,450					2810	800				
13,351	79,000				10	1180	530				

COUNTIES.	Population on a Square Mile.	Population in 1821.	Square Miles in each County.	Number of Marriages from 1810 to 1820.	Number of Baptisms from 1810 to 1820.	Proportion of Births to 100 Marriages.
Buckingham	185	136,800	740	9,505	37,518	
Oxford	186	139,800	752	9,131	39,633	
Essex	193	295,300	1532	19,726	79,792	
Cornwall	198	262,600	1327	17,363	74,611	
Durham	199	211,900	1061	14,787	58,222	
From 150 *to* 200.				264,516	1,033,039	390
Derby	212	217,600	1026	14,226	58,804	
Somerset	220	362,500	1642	24,356	95,802	
Leicester	221	178,100	804	13,366	47,013	
Nottingham	228	190,700	837	14,296	55,517	
From 200 *to* 250.				66,244	257,136	388
Hertford	251	132,400	528	7,386	35,741	
Worcester	258	188,200	729	13,178	53,838	
Chester	262	275,500	1052	20,305	75,012	
Gloucester	272	342,600	1256	28,864	90,671	
Kent	282	434,600	1537	33,502	135,060	
From 250 *to* 300.				103,255	390,322	378
Stafford	303	347,900	1148	27,093	105,657	
York, West Riding	309	815,400	2633	62,062	215,061	
Warwick	310	280,000	902	22,786	74,352	
From 300 *to* 350.				111,941	395,070	353
Surrey	536	406,700	758	27,450	98,592	
Lancaster	585	1,074,000	1831	85,318	274,550	
From 500 *to* 600.				112,768	373,142	331
Middlesex	4140	1,167,500	282	109,475	269,765	246
Above 4000.				863,482	3,100,118	359

Note.—It is clear that in a population which is regularly increasing in a given ratio, the half of its sum at the commencement and at the termination of any interval will not accurately express its mean amount during the whole period, but will, to a certain degree, exceed it. But as I think I have sufficiently proved, in the ter-

Deaths from 1810 to 1820.	Mean Populat. 1811—1821.	PROPORTIONS.			ADDITIONS OF UNENTERED.			PROPORTIONS.			
		Births, 1 to	Deaths, 1 to	Marriages 1 to	Marriages.	Births.	Deaths.	Births, to 100 Margs.	Births. 1 to	Deaths, 1 to	Margs. 1 to
23,386	129,200				20	1920	1050				
22,992	131,500					860	30				
48,067	278,100				10	4100	1620				
36,977	243,250				20	1990	200				
37,745	197,750				50	4480	830				
588,284	3,442,150	33	58	130	300	43,440	9930	406	32	57	130
33,846	204,650				10	2930	840				
56,811	337,900				10	1680	530				
28,721	166,600				30	3100	1520				
32,398	179,550					1850	680				
151,776	888,700	34	58	134	50	9560	3570	402	33	57	134
21,184	123,900				20	2690	1800				
33,541	177,050				10	750	190				
49,624	255,050					1780	590				
51,393	318,850				10	2770	2090				
85,173	410,100					7020	1050				
240,915	1,284,950	33	53	124	40	15,010	5720	392	31	52	124
62,257	325,950				10	2510	380				
122,981	745,250				60	20,840	9640				
52,751	258,200				30	2020	620				
237,989	1,329,400	33	55	119	100	25,370	10,640	375	31	53	118
74,325	370,700					2650	3180	332	32	46	108
178,847	965,000				10	56,100	15,420				
253,172	1,335,700	35	52	118							
216,667	1,076,300	39	49	98	170	37,190	31,750				
1,911,189	10,679,850	34	56	123	1910	206,960	87,700	382	32	53	123

minating chapter of the preceding Book, that the census of 8 was considerably deficient as compared with that of 1821, I conceive the simpler mode I have adopted, namely, that of taking half the sum of the population in the first and last year, will more accurately give the true mean population, than if, overlooking the deficiency

(4) To collect, then, the decisive proofs of the law of population which the preceding table affords, and to present them, in one point of view: Where the inhabitants are found to be on the square mile,

From	50 to 100, (2 Counties[1]) the births to 100 marriages are	420
—	100 to 150, (9 Counties)	396
—	150 to 200, (16 Counties)	390
—	200 to 250, (4 Counties)	388
—	250 to 300, (5 Counties)	378
—	300 to 350, (3 Counties)	353
—	500 to 600, (2 Counties)	331
—	4000, and upwards, (1 County)	246

(5) Now, I think it quite reasonable to conclude, that, were there not another document in existence relative to this subject, the facts thus deduced from the census of England are fully sufficient to demonstrate the position, that the fecundity of human beings varies inversely as their numbers. How, I ask, can it be evaded? There can be here no appeal to the various operation of the checks, or to the dissimilar customs, civil or religious, which it may be said affect countries so differently, when severally compared: on the contrary, the population of England, occupying an area comparatively small; exercising to the fullest practical extent civil and religious liberty, and intimately blended together, by its unceasing movements, can be little subject to the mere local or unequal operation of those powerful causes which may have a varying influence upon human

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alluded to, it were calculated by the truer and more exact method. The above observations, I conceive, will apply to the generality of national censuses, the later ones among which it may be safely concluded are the more correct. But after all, it must be evident that, as the present argument is founded principally on comparative results, it is as fully established by the relative, as it could be by the actual accuracy of the documents by which it is demonstrated.

[1] The number of the counties includes the three ridings of Yorkshire, as given in the population abstracts, making, therefore, 42 instead of 40 divisions of England.

increase in different nations. But admitting that such variations exist to a certain degree, still it will hardly be argued, I think, that they would be regulated in their operation by the comparative number of human beings upon the square mile; excepting, indeed, what is deemed the most unimportant of them, the "preventive check," as it is called; and concerning this, a glance at the table will shew that, if it operates at all, it operates in a manner directly contrary to the suppositions of those who dwell so much upon its influence, and that it confirms, therefore, instead of weakening, the general deductions. But this subject will be distinctly adverted to hereafter. As to any objections founded upon the supposed inaccuracy of the registers, that would be still more futile, unless we could be brought to believe that their comparative correctness was to be determined upon a principle of planimetry[1].

(6) It is admitted, however, that there are considerable deficiencies in the statistics of the country, to the no slight discredit of those who might be the means of ensuring the correctness of public documents of a nature so highly important in every point of view. These have been attempted to be rectified by the additions of the unentered marriages, births, and

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[1] If, however, the counties in the preceding table be examined individually, there will be found some considerable variations from the general rule; but then they are instances which, on due examination, not only admit of being fully accounted for, but when so explained, still further confirm and strengthen the proofs brought forward. Thus, for instance, the counties in the immediate vicinity of London, as noticed by Mr. Rickman, exhibit somewhat too great a degree of fecundity, in consequence of the practice which prevails, to a certain extent, of marriages from thence being occasionally celebrated, and consequently registered, in the metropolis, the baptisms, on the contrary, being registered in the places where the parents are generally resident. Other counties, when singly considered, exhibit too small a degree of prolificness; (Northumberland, for instance, owing likewise to irregularities in the registers;) still however such exceptions are claimed. In this table, the whole facts are included, and the instances of this nature are sufficiently numerous to balance each other, and to establish, as already explained, in the general average, a uniformity in the results perfectly decisive.

deaths, as obtained from the official queries addressed to every parish in the kingdom; the answers to which, though still, perhaps, not critically exact, are doubtless far nearer being so than any vague guesses upon the subject could be: at all events, they are sufficiently accurate for all the purposes of the present argument, which, it is to be remembered, rests as certainly upon the comparative, as it could upon the absolute, correctness of these various data. These supplementary numbers I have also inserted in succeeding parts of the table, and again calculated the prolificness of marriages, and also the proportion of marriages, births, and deaths, so increased, on the mean population, as previously calculated, of 1811 and 1821; and have given the proportions in the four last columns. The proof is thus subjected to another test, but it is one which it has fully sustained. Thus corrected, therefore, where the population is, on the square mile,

From 50 to 100, the births to 100 marriages are	427
— 100 to 150	414
— 150 to 200	406
— 200 to 250	402
— 250 to 300	392
— 300 to 350	375
— 500 and upwards	332

(7) The proof of the law of population, therefore, as deduced from the latest published registers of this country, is not merely satisfactory; it is decisive: and any further appeal to the censuses of England will, probably, be deemed superfluous, especially as the abstracts given for the first ten years of the present century are, for reasons already assigned, undoubtedly less complete than those of the succeeding

decenniary, on which the foregoing table is founded. Still, induced by the demonstration afforded by this examination, I have, while the preceding tables have been printing, formed another, calculated on the registers of the former term, namely, from those of 1800 to 1810, inclusive; varying also the method of proof as well as the facts referred to, in order to put the principle at issue to a test of a different kind, and one assimilated as far as possible with the method pursued regarding the census of France, as arranged by the statistical writers of that country. I have, therefore, taken, as the basis of the ensuing computation, the extent, in statute acres, of the several counties of England, and, dividing that extent by the population of each in 1801, have classed the table accordingly. The divisions distinguish those counties where there is less than one acre of surface to each individual; next, those in which there is from one to two; then, where there are from two to three; from three to four; from four to five; and lastly, from five acres and upwards, to every inhabitant: the marriages and births, during the term specified, are given, and the proportion of the latter to the former, in the several sections, rising, as it will be seen to do, as the population becomes less dense, affords a further, and, I think I may again add, an irrefragable demonstration that the principle at issue is true, examined by whatsoever method, and applied to whatever period.

TABLE LXIII.

DEMONSTRATING THE LAW OF POPULATION, BY THE REGISTERS OF ENGLAND, FROM THE YEARS 1800 TO 1810 INCLUSIVE.

Counties.	Acres to each Inhabitant.	Population in 1800.	Area in Statute Acres.	Marriages from 1800 to 1810.	Baptisms from 1800 to 1810.	Baptisms to 100 Marriages.
Middlesex	under 1	845,400	140,486	100,774	229,411	227
Lancaster......	1 to 2	695,100	1,171,840	76,172	260,008	
Surrey........		278,000	485,120	24,749	84,640	
				100,921	344,648	341
Warwick	2 to 3	215,100	577,280	19,663	63,717	
Stafford		247,100	734,720	24,292	88,362	
				43,955	152,079	348
Hertford.......	3 to 4	100,800	337,920	6,844	31,559	
Gloucester		259,100	803,840	23,540	75,185	
Kent..........		317,800	983,680	31,559	121,443	
Worcester......		143,900	466,560	12,165	47,040	
Chester........		198,100	673,280	17,375	63,427	
Nottingham ...		145,000	535,680	13,721	49,203	
Somerset		282,800	1,050,080	23,523	81,631	
Leicester		134,400	514,560	11,544	38,959	
Derby.........		166,500	656,640	13,479	53,301	
				153,750	561,748	365
Durham	4 to 5	165,700	679,040	13,782	50,823	
Yorkshire......		887,200	3,698,387	80,678	290,077	
Essex		234,000	980,480	19,675	71,213	
Berks		112,800	483,840	8,223	34,463	

TABLE LXIII.—(*continued.*)

Counties.	Acres to each Inhabitant.	Population in 1800.	Area in Statute Acres.	Marriages from 1800 to 1810.	Baptisms from 1800 to 1810.	Baptisms to 100 Marriages.
Bucks	4 to 5	111,000	477,600	9,140	33,908	
Oxford		113,200	488,280	8,649	34,899	
Cornwall		194,500	849,280	15,455	65,942	
Suffolk		164,600	936,880	18,135	70,449	
Bedford		65,500	296,320	5,560	20,371	
Southampton		226,900	1,041,920	23,229	77,058	
Wilts		191,200	882,560	14,198	53,098	
Devon		354,400	1,650,560	33,800	111,601	
Norfolk		282,400	1,333,880	22,702	93,726	
Salop		172,200	673,280	13,536	53,876	
				286,762	1,061,004	370
Northampton	5 and upwards.	136,100	734,720	10,555	37,540	
Dorset		119,100	643,200	9,251	34,631	
Rutland		16,900	95,360	1,110	4,954	
Sussex		164,600	936,330	14,611	61,267	
Cambridge		92,300	549,120	7,958	32,417	
Hereford		92,100	556,400	6,315	25,510	
Huntingdon		38,800	236,800	3,257	12,133	
Monmouth		47,100	318,720	4,058	11,834	
Northumberland		162,300	1,197,440	11,989	38,228	
Cumberland		121,100	945,920	9,666	36,250	
Lincoln		215,500	1,758,720	18,883	74,824	
Westmoreland		43,000	488,320	3,378	14,208	
				101,031	383,796	386

(8) From the years 1800 to 1810, therefore, the condensation of the population in the different counties, taken at its amount at the period of the first census, thus affected the prolificness of marriages: where the proportion of surface was less than one acre of land to each individual, there the registered proportion of baptisms to marriages was as 227 to 100: where the proportion was between one and two acres to each person, the baptisms to the same number of marriages were as 341 to 100; where there was between two and three acres to each, the number was as 348 to 100; where between three and four, as 365 to 100; where between four and five, as 370 to 100; and, lastly, where the space was upwards of five acres to each, the prolificness of 100 marriages rose to 380 baptisms[1].

(9) I conceive it would weaken the force of these results to add a single word in the way of comment upon them: and with these surprisingly accurate demonstrations of the principle in question, before our eyes, we may safely conclude that were we in possession of the necessary facts, the argument might still be successfully extended to a yet more minute series of proofs deduced from a comparison of the different degrees of human prolificness even in the several divisions of the same counties, with reference to the density of their population respectively. The facts, however, necessary for such a further and more minute examination do not, at present, exist. These I have attempted to supply in a single instance, and that the most important one in the kingdom; and I present the result, which is as follows.

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[1] I have not had time to make the calculations relative to the proportions of the marriages and of the deaths in this latter table, which I have done in the former one; if I had, I have no doubt that the results would be very similar.

(10) The county palatine of Lancaster, as has been justly observed, seems to comprise within itself an epitome of the kingdom, including all its various interests, whether agricultural, manufacturing, commercial, or shipping. To this county, therefore, I directed my attention with a view to ascertain whether the law of population, which it has been just shewn is in manifest operation in the counties of the kingdom collectively considered, is likewise to be deduced from their subdivisions. Lancashire appears to be divided into six hundreds, those of Salford, Blackburn, West Derby, Almondness, Leyland, and Lonsdale. Taking a tolerably large sized map, and reducing these into regular mathematical figures, I calculated by planimetry, as accurately as I could, their respective areas in square miles; and according to their relative proportions I divided the known contents of the entire county. That the results which I thus obtained are precisely accurate I do not mean to contend; though I think they will not be found materially otherwise, when compared with that official information which I understand it is intended to communicate. I perhaps ought to state, that these computations were made before the comparative prolificness of the different hundreds had been ascertained, and that they were not altered one iota in order to accommodate the facts to the demonstration now presented.

TABLE LXIV.

SHEWING THE OPERATION OF THE LAW OF POPULATION IN THE DIFFERENT HUNDREDS OF THE COUNTY OF LANCASTER.

Hundreds.	Population on each Square Mile.	Square Miles.	Population in 1821, exclusive of Towns of separate Jurisdiction.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Baptisms to 100 Marriages.
Lonsdale .	96	441	42,486	3651	16,129	442
Almondness	267	228	60,930	3670	15,228	415
Leyland .	354	126	44,583	2858	11,182	391
West Derby	409	377	154,040	24,182	86,407	357
Blackburn .	513	286	146,608	10,814	31,463	291
Salford . .	869	373	323,592	40,143	114,941	286

(11) The results thus obtained have, I confess, surprised myself. The law in question I think is, generally speaking, to be deduced only from the averages of proofs sufficiently numerous to counteract or compensate for those constant aberrations which occur in conformity with the principles already laid down. I did not, therefore, expect to find that the general rule of fecundity would have been thus minutely proved from instances singly compared and considered. Such, however, is the fact: and it cannot fail making a deep additional impression upon the mind of every candid inquirer on this momentous subject. Perhaps, however, the towns of exempt jurisdiction ought to have been included in the population of the hundreds in which they are respectively situ-

ated, in which case one hundred, that of Blackburn, would have been placed before that of West Derby, and consequently would have shewn a less degree of prolificness. But this again would have been an exception which would have fully corroborated the principle, as already explained. Blackburn, in regard to so large a part of it being sterile and so thinly inhabited, is, in proportion to the part chiefly occupied, and the natural fertility of that part, far more fully peopled than West Derby.

(12) With these clear indications of the principle, presented by the examination of only one of the counties of England, I have no hesitation in asserting that were all the hundreds, &c. of the entire kingdom thus classed, the results already obtained by computations from the statistics of the several counties would receive a confirmation equally strong and minute. This course is, however, at present, obviously impracticable; I shall therefore close this branch of the argument by presenting a proof of the law of population of a similar nature, though differing somewhat in form; namely, one grounded upon the varying prolificness of marriages in the principal English islands; and I do so, not that I think the argument needs this additional corroboration, but because an appeal has been made to the progress of population when thus insulated, as though it presented an overwhelming proof of the truth of the contrary theory.

(13) The only islands in the British seas, the statistics of which I have examined with a view to this subject, are the Isle of Man, the Isle of Wight, and the Norman Isles. These class themselves as placed in the following Table.

TABLE LXV.

SHEWING THE OPERATION OF THE LAW OF POPULATION IN THE PRINCIPAL ISLANDS IN THE BRITISH SEAS[1].

Islands.	Inhabitants to a Square Mile.	Area in Square Miles.	Population in 1821.	Marriages from 1810 to 1820.	Baptisms from 1810 to 1820.	Proportion of Baptisms to 100 Marriages.
Wight .	213	148	31,616	2222	9725	437
Man .	250	160	40,081	2537	10,981	433
Norman Isles	494	100	49,427	4254	15,464	363

(12) In these instances, therefore, the law of population manifests itself in actual operation in the very cases which the principal advocate of the doctrine of human superfecundity supposes best exemplify that theory. The subject is here sufficiently "narrowed;" the "smallness of these states," if they may be so termed, must bring "the subject immediately home to every thinking person[2]:" and if we take the whole earth instead of an island , it is abundantly clear from the proofs derived from islands, whether those of England or Ireland, or the small and dependant ones just examined, that no such principle as the geometric ratio of human increase has any existence in Nature: it is equally so that it is not the "preventive check" that withstands its operation; a single glance at the last, or any of the preceding tables, will demonstrate to the contrary, of which more hereafter.

(14) I cannot refrain from adding, what may per-

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[1] The marriages in the Isle of Wight are as 1 in 442 on the whole population, and 1 in 116 in the Norman Isles.

[2] Malthus, Essay on Population, p. 163.

[3] Ibid., p. 8.

haps be considered as misplaced in this part of the discussion, that so far from these isolated seats of human existence being those in which mankind, if unchecked, must speedily multiply into unsustainable numbers, and manifest the insufficiency of Divine Providence, they are so many theatres, if I may so speak, in which He has condescended to exhibit his inexhaustible bounties, and to display his unerring foresight and unvaried care in behalf of his creatures. Not to speak of those flights of birds which usually direct their course to the islands of the sea, innumerable multitudes of fishes are constantly found on their coasts, furnishing, in addition to the edible products of the earth, a supply of food, as well as a mine of wealth, literally inexhaustible; the multiplication of which, it will hardly be denied, is as great as that of human beings. The geometric ratio of increase amongst the tribes of the ocean is, I repeat, at least as rapid and as certain as that which multiplies those upon land; and, in spite of all suppositions and assertions to the contrary, fishes we shall still believe will continue as prolific as fishermen.

(15) Perhaps it is to the immensity of this provision that the superior fertility of human beings on the coasts of the ocean (a fact long ago observed, and I believe never controverted[1]) may be justly attributed. It is the main object of Nature to multiply her sentient offspring up to the means of their subsistence; at the same time, that by the simple and beneficent law we are now contemplating and attempting to demonstrate, she as carefully guards their numbers from undue increase: thus multiplying at once the enjoyment of vitality to the utmost possible extent, and preventing the pleasure so conferred from degenerating into wretchedness and misery.

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[1] Dr. Clarke, Travels in Scandinavia, p. 528.

CHAPTER IX.

OF THE LAW OF POPULATION: AS PROVED BY THE CENSUSES OF FRANCE.

(1) FRANCE will, perhaps, be considered the next country after our own, in which we ought to seek the development of the principle under consideration, if true; in consequence of the presumed accuracy of the published data in reference to the subject: though I must confess, that after I had demonstrated its existence to my entire satisfaction, I did not conceive that it would manifest itself very distinctly in those countries where the population, on the whole, is evenly distributed, and differing but slightly in other respects. France, in particular, I regarded as a country where the rural avocations prevailed so generally, and which appeared in relation to its productiveness, to be in the main so equally inhabited, that I was not very confident it would furnish a series of those minute proofs of the theory in question, which, as we have already seen, England affords. I had, indeed, examined the documents regarding France, so far as to compare the relative fecundity of marriages in the crowded departments, such as the Seine, the district of Rouen, &c., with others thinly inhabited, and was fully satisfied that the principle was in undoubted operation in France. I was further confirmed in this opinion by adverting to the tables given by MM. Sejour, Condorcet, and De la Place, in the Histoire de l'Académie Royale, concerning the popula-

tion, births, and marriages in the thirty-three generalities of that kingdom[1], in which, notwithstanding there appear to be not a few "approximations," as they are termed, indicating much uncertainty as to the actual fidelity of the documents inserted, still the general results are satisfactory. Lastly, when I adverted to the authority of Necker, as to the comparative prolificness of different parts of that kingdom, I had no doubt but that France might be confidently appealed to as unequivocally demonstrating the true law of human increase. The latter, however, makes no direct reference to the fertility of marriages, as regulated by the co-existing numbers, of which he did not appear to be in the least degree aware; and the facts to which he adverted have constantly been so misunderstood as to be perfectly consistent with the theory I am opposing. Early, therefore, in my present inquiry, I thought it desirable to examine the statistical documents lately presented to the world, respecting that large and important portion of Europe; and, as in the case of England, neither altering in the least degree the published facts, nor omitting any of the continental departments of the country. In the present case, moreover, I take the classification of the population as given by their own authorities. Commencing, therefore, as before, with those divisions in which the inhabitants are, in reference to the area they occupy, the fewest, the departments thus divide themselves: First, those where there are from four to five hectares to each inhabitant; second, where there are from three to four; third, where there are from two to three; fourth, where there are from one to two; fifth, where there are less than one; and sixth, where there is not a sixteenth of a hectare to each, namely the department of the Seine, which, as containing a population so vastly more dense than any other part of the country, ought, like the county of Middlesex, in the English table, to be presented singly. The following is the proof which the calculation affords to the law of population:

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[1] Année 1783, pp. 701, 702, 703.

TABLE LXVI.

DEMONSTRATING THE LAW OF POPULATION BY THE CENSUSES OF FRANCE.

Departments.	Hectares to each Inhabitant.	Mean Number of Legitimate Births to each Marriage.	Proportion of Illegitimate Births to 1 Legitimate.	Mean Number of the Births to the Population, 1 in	Mean Number of Marriages to the Population, 1 Marriage to	Mean Number of Deaths to the Population, 1 to	Mean Number of Legit. Births to 100 Marriages, *Bul. Universel*, vol. xii. pp. 52, 53, 54.	Legitimate Births to each Marriage, *Annuaire*, 1826.
Alpes, Basses .	4.88	4.870	23.018	29.315	148.890	37.271	4.72	3.82
Alpes, Hautes .	4.49	5.391	23.076	28.324	159.298	34.930	5.23	4.13
		10.261	46.094	57.639	308.188	72.201	9.95	7.95
4 hectares and upwards to each.		5.130	23.047	28.819	154.094	36.100	4.97	3.97
Lozère . . .	3.80	4.307	25.157	35.595	168.288	37.190	4.51	3.95
Landes . . .	3.55	4.293	15.302	30.235	137.990	36.120	4.31	3.74
Indre	3.05	4.516	20.046	26.842	127.218	37.793	4.36	3.98
		13.116	60.505	92.672	433.496	111.103	13.18	11.67
From 3 to 4.		4.372	20.168	30.891	144.499	37.034	4.39	3.89
Cher	2.98	4.175	23.574	26.455	115.117	36.250	4.10	3.59
Pyrenées Orientales	2.83	5.170	15.167	25.614	141.140	32.488	5.07	4.37
Loire-et-Cher .	2.78	3.977	13.864	29.287	124.275	38.821	3.87	3.47

TABLE LXVI.—(*continued.*)

Departments.	Hectares to each Inhabitant.	Mean Number of Legitimate Births to each Marriage.	Proportion of Illegitimate Births to 1 Legitimate.	Mean Number of the Births to the Population, 1 in	Mean Number of Marriages to the Population, 1 Marriage to	Mean Number of Deaths to the Population, 1 to	Mean Number of Legit. Births to 100 Marriages, *Bul. Universel*, vol. xii. pp. 52, 53, 54.	Legitimate Births to each Marriage, *Annuaire*, 1826.
Marne	2.69	4.049	11.267	29.692	130.175	38.684	3.86	3.65
Vienne	2.65	3.591	35.124	34.104	125.957	47.940	3.60	3.60
Aube	2.63	3.937	18.642	32.459	135.054	45.040	3.84	3.34
Marne, Haute .	2.62	4.776	17.507	35.911	180.239	49.526	4.29	3.80
Aveiron . . .	2.60	3.742	21.981	36.095	168.034	48.128	4.39	3.99
Nièvre . . .	2.57	4.572	19.747	23.971	124.610	33.802	4.29	3.69
Aude	2.49	3.702	20.225	31.517	147.369	35.810	4.37	3.70
Côte d'Or . .	2.48	4.034	15.599	33.904	145.207	43.830	4.02	3.86
Arriège . . .	2.42	4.072	22.916	33.546	163.347	44.101	4.76	3.91
Loiret . . .	2.42	4.106	9.986	28.168	127.243	34.248	3.98	3.84
Cantal . . .	2.41	4.544	15.335	38.700	186.850	44.071	4.42	3.61
Drôme . . .	2.40	4.404	16.348	29.397	135.991	39.230	4.31	3.82
Var	2.39	4.579	14.800	31.290	152.977	33.730	4.53	3.73
Pyrenées, Hautes	2.29	4.908	12.125	35.166	189.897	53.510	4.90	4.23
Eure-et-Loire .	2.28	3.802	14.475	31.[illegible]	128.695	43.460	3.71	3.72
Indre-et-Loire .	2.28	3.960	16.601	32.763	137.797	47.671	3.87	3.38

Doubs . . .	2.26	4.499	12.512	31.679	153.556	40.614	4.45	4.32
Yonne . . .	2.16	3.575	16.616	32.885	132.522	43.648	3.64	3.42
Creuse . . .	2.14	4.337	14.353	30.493	141.512	48.423	4.34	3.78
Vendée . . .	2.13	5.464	62.486	30.075	165.897	34.430	5.47	4.87
Corrèze . . .	2.10	4.769	19.330	28.775	143.997	37.990	4.69	4.05
Vienne, Haute .	2.10	4.329	19.940	25.917	117.905	35.250	4.39	4.07
Sèvres (Deux) .	2.09	4.349	25.461	34.612	156.297	48.280	4.24	3.52
Dordogne . .	2.08	3.899	21.375	34.068	138.906	37.382	3.90	3.78
Allier . . .	2.07	4.138	17.173	26.430	115.640	37.481	4.08	3.43
Meuse . . .	2.07	4.434	17.333	30.342	142.127	39.587	4.38	3.95
Gers	2.05	3.598	15.253	38.233	146.502	46.578	3.60	3.29
		127.500	577.085	943.160	4314.835	1240.003	127.36	113.78
From 2 *to* 3.		4.250	19.236	31.438	143.828	41.333	4.24	3.79
Seine-et-Marne .	1.97	3.916	16.324	29.071	127.020	39.387	3.76	3.69
Gironde . . .	1.96	3.317	10.676	35.140	127.458	43.587	3.26	2.87
Hérault . . .	1.92	4.529	21.340	30.419	144.208	36.060	4.44	3.91
Pyrenées, Basses	1.91	4.291	12.393	35.908	166.477	50.268	4.29	4.10
Ardennes . .	1.90	3.656	16.106	30.439	130.062	41.435	3.93	3.61
Lot	1.89	4.269	37.636	20.383	168.504	43.164	4.17	3.75

TABLE LXVI.—*(continued.)*

Departments.	Hectares to each Inhabitant.	Mean Number of Legitimate Births to each Marriage.	Proportion of Illegitimate Births to 1 Legitimate.	Mean Number of the Births to the Population, 1 in	Mean Number of Marriages to the Population, 1 Marriage to	Mean Number of Deaths to the Population, 1 to	Mean Number of Legit. Births to 100 Marriages, *Bul. Universel*, vol. xii. pp. 52, 53, 54.	Legitimate Births to each Marriage, *Annuaire*, 1826.
Tarn	1.83	4.620	29.305	32.271	154.248	37.235	4.59	3.64
Gard	1.80	4.804	28.726	29.633	143.358	34.895	4.75	4.24
Ardèche . . .	1.80	4.233	42.117	30.038	130.143	40.405	4.28	3.79
Loire, Haute . .	1.79	4.607	31.017	32.465	154.381	38.460	4.52	3.79
Moselle . . .	1.78	4.643	13.877	26.400	141.185	40.892	4.65	4.33
Ain	1.78	4.799	33.120	32.111	158.363	33.857	4.63	3.78
Saône-et-Loire .	1.72	4.428	20.442	29.308	135.976	37.250	4.35	3.75
Garonne, Haute .	1.72	4.022	15.378	32.179	137.835	36.014	4.02	3.79
Morbihan. . .	1.71	5.525	31.754	28.857	164.153	31.240	4.89	4.87
Charente . . .	1.70	4.335	19.454	33.025	150.537	43.590	4.29	3.60
Saône, Haute .	1.68	3.972	11.650	29.873	127.494	43.041	3.99	3.79
Jura	1.67	5.018	20.384	34.670	182.060	38.925	4.87	3.89
Isère	1.65	4.784	12.238	29.490	148.780	39.767	4.53	3.90
Maine-et-Loire .	1.63	3.886	18.703	33.815	138.811	47.170	3.82	3.84
Bouches du Rhône	1.62	3.496	9.525	26.687	128.529	31.748	4.37	4.50

Aise	1.61	3.257	4.572	28.408	124.066	39.069	4.03	3.78
Mayenne . . .	1.51	5.093	18.544	33.299	178.458	44.089	4.88	3.69
Oise	1.49	3.531	18.021	34.686	129.157	42.897	3.38	3.14
Sarthe. . . .	1.49	3.754	10.779	32.681	132.640	50.650	3.65	3.87
Vaucluse . . .	1.47	4.812	17.239	25.582	130.325	30.220	4.81	4.21
Meurthe . . .	1.47	4.546	12.355	29.669	145.550	37.866	4.39	3.78
Puys-de-Dome .	1.46	3.953	22.918	32.728	135.033	41.135	3.93	3.54
Finisterre . .	1.44	4.638	28.392	28.778	137.266	26.260	4.66	4.25
Loire Inférieure	1.41	4.806	14.097	31.371	161.254	45.270	4.66	3.77
Lot-et-Garonne .	1.40	3.359	17.681	41.098	145.841	45.960	3.23	2.64
Eure	1.40	3.231	16.039	39.856	136.743	44.182	3.20	2.86
Vosges . . .	1.39	4.094	14.978	32.675	141.910	44.507	4.13	3.93
Côtes du Nord .	1.35	4.753	36.098	29.144	145.207	43.83	4.73	4.90
Loire	1.35	5.085	29.605	25.483	133.861	33.969	5.01	4.14
Orne	1.33	3.861	20.852	40.488	163.820	50.790	3.86	3.40
Seine et Oise . .	1.29	3.541	16.303	33.579	126.102	39.499	3.43	3.02
Isle de Vilaine .	1.19	4.082	40.786	32.500	135.645	34.72	4.09	3.80
Somme . . .	1.19	4.105	12.447	32.688	144.863	41.592	4.01	3.63
Charente Inférieure	1.18	3.837	23.999	30.903	123.486	34.556	3.81	3.55
Calvados . . .	1.13	3.180	8.988	44.374	156.797	50.354	3.16	2.61

TABLE LXVI.—(*Continued.*)

Departments.	Hectares to each Inhabitant.	Mean Number of Legitimate Births to each Marriage.	Proportion of Illegitimate Births to 1 Legitimate.	Mean Number of the Births to the Population, 1 in	Mean Number of Marriages to the Population, 1 Marriage to	Mean Number of Deaths to the Population, 1 in	Mean Number of Legit. Births to 100 Marriages, *Bul. Universel*, vol. xii. pp. 52, 53, 54.	Legitimate Births to each Marriage, *Annuaire*, 1826.
Pas de Calais .	1.07	4.099	10.575	31.980	143.577	44.369	3.99	3.95
Rhin, Haut . .	1.04	4.796	14.783	26.794	136.679	38.012	4.70	4.50
Manche . . .	1.01	4.727	14.281	39.668	200.589	48.586	4.65	3.65
		186.290	876.692	1402.414	6368.451	1780.772	184.79	165.04
From 1 *to* 2		4.234	19.925	31.877	144.737	40.472	4.20	3.75
Tarn et Garonne	.95	3.935	23.771	37.988	155.648	42.257	3.82	3.00
Seine Inférieure .	.90	3.422	7.506	32.267	125.094	38.505	3.41	3.38
Rhin, Bas . .	.83	5.039	14.356	25.738	138.821	37.247	5.09	4.83
Rhone . . .	.71	3.901	5.910	27.957	134.164	34.504	4.07	3.23
Nord	.62	4.432	8.926	27.739	136.644	36.127	4.37	4.12
		20.729	60.469	151.689	690.371	188.640	20.76	18.56
Under 1		4.146	12.094	30.338	138.074	37.728	4.15	3.72
Seine	.06	2.557	2.660	29.360	111.336	32.860	2.63	2.53

(2) The above table, which transfers the proof of the law of population to the continent, presents us, then, as it respects France, with the following facts. The legitimate births are, in those departments, where there are to each inhabitant,

From 4 to 5 hects.	**(2 departs.) to every 1000 marriages,**	**5130**
3 to 4 ..	**(3 do.)** . . .	**4372**
2 to 3 ..	**(30 do.)** . . .	**4250**
1 to 2 ..	**(44 do.)** . . .	**4234**
.06 to 1 ..	**(5 do.)** . . .	**4146**
and .06 ..	**(1 do.)** . . .	**2557**

(3) The above are the results of calculations on the official facts communicated by the "Annuaires du Bureau des Longitudes," for the years 1817, 1818, 1819, 1820, and 1821[1]: but a column is given in the preceding table, calculated in a somewhat different manner, the period embraced not being exactly the same: and the proportions, it will be observed, are not identical, but, relatively considered, they exhibit a most striking analogy; confirming, in all respects, as is justly observed in the work from which I take them the correctness of each computation. I have also added in the last column, a computation which I made on a single year (1826), as a further confirmation that the law of Nature, in reference to human prolificness, is in constant operation. The two last columns of the table give us the following facts, classed as before.

Hect. to each Inhabitant.	Number of Departments.	Legit. Births to 100 Marriages.	Legit. Births to 100 Mar. (1826.)
4 to 5	2	497	397
3 to 4	3	439	389
2 to 3	30	424	379
1 to 2	44	420	375
under 1	5	415	372
and .06	1	263	253

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[1] Bull. Universel des Sciences, Géog., &c., t. vi., pp. 914.

(4) Is there any possibility of gainsaying the conclusion these facts force upon us; namely, that the fecundity of marriages is regulated by the condensation of the population, and inversely to it? Should any evasion be attempted, by arguing about the supposed prevalence of the preventive check in the more crowded districts, and the consequent postponement of marriages, a reference to the tables already given will instantly dissipate it. But this subject will be distinctly discussed hereafter.

CHAPTER X.

OF THE LAW OF POPULATION, AS PROVED BY THE CENSUSES OF PRUSSIA.

(1) I SHALL now briefly examine the statistics of Prussia, with which the labours of one of the most indefatigable writers on the subject, Sussmilch, has made us acquainted, at a comparatively early period. In the third volume of his Göttliche Ordnung, the marriages and births of the Prussian monarchy are given at two different and distant periods, namely, in the years 1754 and 1784; the latter I presume to be the most correct, which is generally the effect of repeated enumerations. Each of them, however, equally demonstrates the principle of population for which I contend. I shall only premise that Prussia is a country which, it is well known, comprises a territory exhibiting the utmost variety of soil and surface; parts of it being extraordinarily fertile, others as strikingly barren, while in some of the provinces a large portion of the superficial extent is taken up by numerous and extensive lakes. As great a difference in the moral and political condition of different parts of that monarchy also exists. These remarks will not only account for those variations in the proportions under consideration, which may be observed on comparing the different provinces, but will even constitute them so many arguments in favour of the principle for which I contend, as already expounded. I have only to add, in reference to the ensuing table, that the two omissions which will be perceived in it, occur in the document from which it is taken.

TABLE LXVII.

DEMONSTRATING THE LAW OF POPULATION FROM THE CENSUSES OF PRUSSIA, AT TWO SEVERAL PERIODS.

Provinces.	Inhabitants on a Square League.	Births to each Marriage. 1756[*].	Average.	Births to each Marriage. 1784[*].	Average.
West Prussia . .	832		4.34	4.75	4.72
Pomerania . .	928	4.34		4.69	
East Prussia .	1175	5.07	4.14	5.10	4.45
New Mark . .	1190	4.22		4.43	
Mark of Brandenburg . . .	1790	3.88		4.60	
East Friesland .	1909	3.39		3.66	
Guelderland . .	2083	4.33	3.84	3.74	4.24
Silesia and Glatz	2314			4.84	
Cleves . . .	2375	3.80		4.03	
Minden and Ravensburg . .	2549	3.67		4.31	
Magdeburg . .	2692	4.03		4.57	
Neufchatel, &c. .	2700	3.39		3.98	
Halberstadt . .	3142	3.71	3.65	4.48	4.08
Ticklingburg and Lingen . .	3461	3.59		3.69	

(2) I subjoin another table similarly constructed, but calculated on the facts collected by Busching, which Pütter has appended to his work on Germany; supplying an omission or two from Baumann.

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[*] Sussmilch, Gött. Ordn., th. iii. Tab., p. 63.

TABLE LXVIII.

DEMONSTRATING THE LAW OF POPULATION FROM THE VARYING PROLIFICNESS IN THE PROVINCES OF PRUSSIA.

Provinces.	Population in 1784.	Inhabitants on each square League.	Births to each Marriage.	Average.
West Prussia and Netz	525,000	832	5.01	5.03
Pomerania . . .	428,451	928	5.06	
East Prussia . . .	855,000	1175	5.13	4.54
New Mark . . .	262,000	1190	4.68	
Mark of Brandenburg	795,000	1790	4.53	
East Friesland . .	103,000	1909	3.83	
Guelderland . . .	50,000	2083	4.19	4.26
Silesia and Glatz . .	1,481,000	2314	5.19 *	
Cleves	95,000	2375	4.16	
Minden and Ravensburg	130,000	2549	4.45	
Magdeburg . . .	280,000	2692	4.66	
Neufchatel . . .	40,500	2700	3.75	
Moers	17,000	2833	3.55	
Halberstadt, &c. . .	126,000	3142	4.59	3.94
Ticklingburg & Lingen	45,000	3461	3.30	

(3) I thus collect the results relating to Prussia as I have done those regarding France and England :

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* The prolificness of Marriages in Silesia is an apparent exception from the general principle. It is only, however, an apparent one. That province is probably the most fertile of any in the Prussian monarchy ; and is, perhaps, the least peopled, in reference to its potential productiveness.

Inhabitants on a Square Mile, German.	Number of Provinces.	Births to 100 Marriages, 1754.	Births to 100 Marriages, 1784.	Births to 100 Marriages. (Busching.)
Under 1000	2	434	472	508
1000 to 2000	4	414	445	454
2000 to 3000	6	384	424	426
3000 to 4000	2	365	408	394

(4) Thus is the law of population deduced from the registers of Prussia also; and were the argument to pause here, it is conclusive. The results obtained from the registers of this and the preceding countries, exhibiting, as they do most clearly, the principle of human increase, it is utterly impossible should have been the work of chance; on the contrary, the regularity with which the facts class themselves in conformity with that principle, and the striking analogy which the whole of them bear to each other, demonstrate equally the design of Nature, and the certainty of its accomplishment.

(5) I regret that I have not had access to any more recent Prussian registers; which I feel confident would continue to indicate the law of population as plainly as the preceding ones: although circumstances already fully explained would prepare me for considerable inequalities in its development, in addition to which an emigration to the Prussian States, unequalled in its amount by any augmentations from a similar cause existing in any other country, not excepting even America, is perpetually taking place, and consequently disturbing the regular progress of the population in a corresponding degree. The following table, however, extracted from one of the German Almanacks for 1829[1], and taken, it appears, from the Gazette d'Etat[2], in which it cannot be doubted the facts are given on

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[1] Alman. de Gotha, 1829. [2] Juil. 1828.

official authority, most clearly indicates that the principle of human increase is as fully operative in Prussia now as it was half a century ago. The facts are classed agreeably to those already given, and are these.

TABLE LXIX.

DEMONSTRATING THE LAW OF POPULATION FROM THE COMPARATIVE INCREASE IN THE PROVINCES OF PRUSSIA, FROM 1820 TO 1827.

Provinces, &c.	Inhabitants on a mille carré.	Milles carrés.	Population in 1827.	Average annual increase per cent. from 1820 to 1827.
Poméranie .	1534	567.1	870.058	1.588
West Prussia .	1658	465.96	772.577	1.913
East Prussia .	1708	702.77	1.200.549	1.856
Posnanie . .	1952	538.44	1.051.137	1.619
Under 2000 *on the mille carré.*			Average Increase.	1.744
Brandebourg .	2097	723.21	1.517.003	1.451
From 2000 *to* 3000 *on ditto.*			Average Increase.	1.451
Saxe . . .	3066	455.33	1.396.240	1.332
Silesie . .	3183	743.3	2.365.949	1.404
Westphalie .	3323	364.3	1.210.712	1.190
From 3000 *to* 4000 *on ditto.*			Average Increase.	1.308
Bas-Rhin . .	4090	306.83	1.115.250	1.279
From 4000 *to* 5000 *on ditto.*			Average Increase.	1.279
Juliers, Cleves, Berg . .	6068	173.49	1.052.803	1.114
5000 *and upwards on ditto.*			Average Increase.	1.114

(6) Thus, by the preceding table it appears that, during the last eight years, the increase has been the greatest where the population has been the smallest, and that the difference has regularly conformed to, and, indeed, fully confirmed, the law of population, as deduced from the statistics of other countries, and by a different method. Hence where there were, in 1827, less than 2000 inhabitants on the square German mile, the average annual increase during the eight preceding years was 1.744 per cent.; where they amounted to between 2000 and 3000 on the same space, that increase was only 1.451; where to between 3000 to 4000, it was 1.308; where to 4000, and less than 5000, 1.279; and, lastly, where to upwards of 5000, on the same area, that increase was 1.114 only, exhibiting a difference, comparing the first and last sections, therefore, in the annual increase, of between 50 and 60 per cent.; the intermediate ones, in the mean time, classing themselves in exact conformity with the principle under consideration. The proof, as it regards Prussia, therefore, might well be considered as conclusive. I am not unwilling, however, to submit the principle to a further and somewhat more rigorous examination. In the following table, then, the subdivisions of these provinces are taken separately, and the whole number classed as before. This more minute method gives the following results:

TABLE LXX.

DEMONSTRATING THE LAW OF POPULATION FROM THE COMPARATIVE INCREASE IN THE SUBDIVISIONS OF THE PROVINCES OF PRUSSIA, FROM 1820 TO 1827.

Divisions of Provinces.	Inhabitants on a mille carré.	Milles carrés.	Population in 1827.	Average annual increase per cent. from 1820 to 1827.
Koslin . . .	1210	258.49	312.710	1.789
Marienwerder .	1418	315.06	446.709	2.035
On the mille carré under 1500.			Average increase.	1.912
Bromberg . .	1569	211.01	331.025	1.787
Gumbinnen . .	1678	297.07	498.440	1.923
Königsberg . .	1731	405.7	702.109	1.789
Stettin . . .	1759	233.13	409.992	1.650
Francfort . .	1876	352.57	661.333	1.572
Stralsund . .	1952	75.48	147.356	1.327
From 1500 *to* 2000.			Average increase.	1.675
Dantzic . . .	2159	150.9	325.868	1.791
Posnanie . .	2199	327.43	720.112	1.452
Potsdam . . .	2309	370.64	855.670	1.330
From 2000 *to* 2500.			Average increase.	1.524
Magdebourg .	2636	204.78	539.807	1.190
Oppeln . . .	2744	247.63	679.601	1.857
Munster . . .	2943	132.16	388.898	.830
Treves . . .	2990	120.99	361.729	1.544
Leignitz . . .	2990	251.24	751.154	1.096
From 2500 *to* 3000.			Average increase.	1.304
Mersebourg . .	3119	186.29	581.059	1.414
Arnsberg. . .	3170	138.73	439.706	1.263
Coblentz . . .	3739	109.43	409.204	1.259
Breslau . . .	3826	244.43	935.194	1.260
From 3000 *to* 4000.			Average increase.	1.299
Minden . . .	4091	93.41	382.108	1.470
Erfurt . . .	4285	64.26	275.374	1.393
Aix-la-Chapelle .	4506	76.41	344.317	1.034
From 4000 *to* 5000.			Average increase.	1.299
Cologne . . .	5061	74.59	377.451	1.087
Dusseldorf . .	6829	98.9	675.352	1.141
5000 *and upwards.*			Average increase.	1.114

(7) In the preceding table, then, the increase in the population of the twenty-five subdivisions of the Prussian provinces, respectively calculated as before, evidences the principle of population contended for, by a difference in the average annual increase in them, when classed as before, of more than 70 per cent., and varied as follows: in that division of the table, where the inhabitants on the square German mile are

Less than 1500, the annual increase has been	1.912
From 1500 to 2000	1.675
2000 to 2500	1.524
2500 to 3000	1.304
3000 to 4000	1.299
4000 to 5000	1.299
and 5000 and upwards	1.114

(8) These proofs of the true principle of human increase, to which I have only had access while these pages were printing, are, considering the circumstances already mentioned, too striking to need a word of explanation.

(9) I recollect only two other countries of which we possess regular registers of marriages and births, which have not been adverted to; namely, Wales and the Kingdom of the Netherlands: the former of which has been already particularized as possessing a surface remarkably varied and mountainous, and, consequently, forming one of those modifications of the general rule which are necessary to accomplish its plain purpose as a law of beneficence: the latter has yet to be considered as exhibiting, in one and the same country, the principle in question, accomplishing, through the very means of its apparent exceptions, its one wise and uniform intent. Previously, however, to entering upon the examination of the censuses of

that kingdom, I shall direct the attention of the reader to those of Ireland and the United States, two parts of the world concerning the population of which more has been latterly said than, perhaps, respecting the increase of all other countries of the earth put together.

CHAPTER XI.

OF THE LAW OF POPULATION, AS PROVED BY THE CENSUS OF IRELAND.

(1) THE statistics of the two countries last named in the preceding chapter, Ireland and the United States, have now to be examined in proof of the law of population; and they are of great importance in the present argument, in as much as they have been perpetually appealed to in proof of the existence of a contrary principle of human increase, and its inevitable effects. It is true that no general or authentic registers of those facts on which the demonstration has been hitherto grounded, namely, of marriages and births, are, as it respects these countries, in existence; a deficiency which seems, at first sight, to render it impossible to derive thence any proofs whatever bearing upon the general argument. A little consideration, however, will enable us to see that the censuses of each afford ample evidence of the true principle of human increase, though the examination has to be pursued in a manner totally different from the foregoing ones; but this dissimilarity in the method of arriving at the conclusion will, if that conclusion coincide with those already deduced from so many other communities, be the more irresistible.

(2) The census of Ireland, for it is to that which we shall first advert, presents us with the population of the Island, and of each county separately, divided into thirteen columns, into which the whole number is classed according to the ages specified. Now it is clear that, other circumstances being the same, the

variations in the proportion of children under a certain age, (say ten years, in order to assimilate the proof as far as may be with that which will be founded on the American censuses,) compared with the prolific adults, those, for instance, from the ages of fifteen to forty inclusive, will indicate the prolificness of marriages in the several counties throughout the island. The question is, whether there is a difference, and if so, whether it conform to the law of population, as developed in this treatise, or otherwise?

(3) Before proceeding to this examination, I will premise that one particular advantage in being obliged to pursue the argument in this mode is as obvious as it is important. It disposes at once, and for ever, of the plausible objection to the proofs deduced from the former method, grounded on the presumed incorrectness in the registers of births and marriages; an objection which will not be readily resigned, though it is plainly a most futile one, as urged against an argument which rests on comparative results. But in this process, the proof is wholly free from all such suspicion; it relies on facts of a totally different nature, namely, those obtained by an actual enumeration of the inhabitants of all ranks and ages, and cannot possibly err so as to affect the argument; as it would be absurd indeed to suppose that, if there were any material omissions in the enumeration, they would be confined to particular ages of it; and it is clear that, so long as that was not the case, but that the deficiency was proportionate throughout (and if one exist, it is inconceivable that it should be otherwise), the results are as decisive, as far as the present inquiry is concerned, as though they were critically exact.

(4) It is highly worthy of remark that these two modes of proof, though perfectly distinct and unconnected, are of such a nature, as not only to supply the

supposed deficiencies of each, but to act as a check upon one another throughout; and that were there no disturbing causes, they would, thus continued, always detect any fallacy in the general deduction, if such existed. Above all, the circumstance of arriving at the same conclusion by so opposite a method, gives additional strength to the entire argument, and places it indeed, it may be confidently asserted, on a basis wholly unassailable.

(5) I will just premise, that had the ensuing demonstration been less clear, I should not have felt my confidence in the truth of the principle already demonstrated, in the least degree shaken. Though, perhaps, individual migration may not be so common there as it is in some other parts of the Empire, for those who remove permanently, generally do so, I believe, in families, (which circumstance cannot affect the argument,) still the fluctuations in the population are very great, especially at certain seasons of the year: a fact which, I confess, prepared me for a far less decisive proof of the principle of population than, on examination, I find Ireland manifests.

(6) The following table[1], then, in which the counties of Ireland are classed according to the density of their population respectively, gives the number of children under ten years of age, and of the adults between the ages of fifteen and forty, in each. The conformity of the variations in these proportions to the principle of population, as laid down in this work, constitutes the proof of the theory as grounded upon the census of Ireland.

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[1] The facts upon which the ensuing table is constructed, with the exception of the areas of the counties being merely reduced to English square miles, and the inhabitants on each, calculated according to their contents in statute acres, which are copied from one of the Emigration Reports, are taken from the census of Ireland, as compiled under the direction of Mr. Mason Shaw: a work of much difficulty under the circumstances in which it was completed, and which does him the highest possible credit.

TABLE LXXI.

DEMONSTRATING THE LAW OF POPULATION FROM THE CENSUS OF IRELAND, OF 1821.

Counties.	Provinces.	English Acres.	Population in 1821.	Inhabitants to a Square Mile.	Inhabitants between 15 and 40.	Children under 10 years of age.	Children to every 10,000.
Kerry . .	M	1,049,193	216,185	130	88,667	64,859	
Galway . .	C	1,603,719	337,364	134	141,480	100,058	
Wicklow. .	L	504,792	110,767	140	42,770	34,609	
Donegal. .	U	1,100,871	248,270	143	98,189	71,798	
Mayo . .	C	1,280,772	293,112	145	119,644	88,942	
Kildare . .	L	383,535	99,065	164	39,895	28,659	
Clare . .	M	771,444	208,089	172	85,415	65,428	
Fermanagh .	U	459,189	130,997	179	53,741	36,664	
King's County	L	457,164	131,088	183	52,973	39,260	
East Meath .	L	531,198	169,183	190	66,783	45,010	
Leitrim . .	C	414,639	124,785	191	49,354	39,991	
Wexford .	L	555,498	170,806	196	69,987	45,956	
Under 200 on the square mile.					908,898	661,234	7275
West Meath .	L	375,111	128,819	213	52,542	37,275	
Tyrone . .	U	766,908	261,865	222	108,237	69,508	
Queen's Coun.	L	381,186	134,275	224	53,916	39,587	
Carlow . .	L	222,021	78,952	227	31,893	23,293	
Sligo . .	C	400,383	146,229	232	59,261	43,466	
Waterford .	M	425,736	156,521	235	65,546	44,373	
Roscommon	C	561,573	208,729	237	86,198	63,886	
Tipperary .	M	899,019	345,896	245	146,343	104,403	
Londonderry	U	531,684	193,869	248	79,678	52,617	
Cavan . .	U	487,620	195,076	254	80,255	57,065	
Kilkenny .	L	486,567	181,946	256	74,237	52,140	
Antrim . .	U	674,406	270,883	257	107,863	76,153	
Cork . .	M	1,699,056	730,444	275	303,002	214,599	
Limerick .	M	626,535	277,477	283	116,958	80,349	
From 200 *to* 300.					1,365,929	958,712	7019
Longford .	L	217,323	107,570	315	43,750	32,055	
Down . .	U	564,651	325,410	367	134,063	91,290	
Monaghan .	U	290,952	174,697	383	72,107	48,726	
From 300 *to* 400.					249,920	172,071	6885
Louth . .	L	179,415	119,129	425	49,718	32,954	
Armagh . .	U	309,663	197,427	428	80,334	54,672	
From 400 *to* 500.					130,052	87,626	6738
Dublin . . *Above* 900	L	230,121	335,892	935	155,628	81,767	5254

(7) From the preceding table, then, it appears that, taking the counties of Ireland indiscriminately, (and there are few countries of equal extent in which there is a greater dissimilarity in those habits which have been long erroneously supposed to govern the principle at issue,) there are in those counties in which there are under 200 inhabitants on the square mile, to every 10,000 between the ages of 15 and 40, 7275 children under ten years of age; where there are from 200 to 300 inhabitants on the same space, there the proportion sinks to 7019; where from 300 to 400, it falls to 6885; from 400 to 500, to 6738; and, lastly, in the county of Dublin, where there are upwards of twice that number of inhabitants, the proportion of children to the same number of adults is as low as 5254.

(8) I might have divided the first sections of the foregoing table so as to have made them differ, in point of population, 50 only on each square mile; and (with one exception only) the results, though thus made more numerous and minute, would still have been equally regular. But this is unnecessary. It is impossible to render the demonstration, as it regards Ireland, more satisfactory and conclusive[1].

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[1] As it respects the further physiological and historical proofs afforded by this interesting portion of the British Empire to the true principle of population, I beg to refer the reader to my work upon that country. I will only repeat here, notwithstanding so many confident assertions to the contrary, that it is thence demonstrable, that while a greater degree of prolificness still attends the scantiest state of population, superior comfort and affluence as invariably accompany the fullest one; and that none of the evils Ireland suffers are attributable to over-population.

CHAPTER XII.

OF THE LAW OF POPULATION, AS PROVED BY THE CENSUSES OF THE UNITED STATES OF AMERICA.

(1) THE United States of America, as the country whence the anti-populationists have professed to derive their proofs of what they term the geometric ratio of human increase, demand our especial attention. Here, again, the registers of marriages and births are wanting; but the population having been taken four successive times, and not only classed in ages peculiarly adapted to such an inquiry as that pursued respecting Ireland, but into sexes also, affording an additional precision to the computation, I have been induced to give particular consideration to the censuses of this important country.

(2) I need not call to the reader's recollection what is constantly asserted respecting this favoured part of the world, concerning which, we are assured, that the means of subsistence are in profuse abundance, the marriages early and universal, and, in fact, where "no "human consideration operates as a hindrance to "reproduction[1]." If, therefore, the principle of population for which I contend were not an inherent law of Nature, but one whose operations were resolvable into the varied influence of the checks so much alluded to, here it would cease to display itself, or, at least, give very feeble indications of its existence. It will be seen, however, how opposite is the fact.

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[1] Dr. Seybert, American Statistics, p. 52.

(3) Again, it ought to be remarked, that the variations in the population of the United States are necessarily confined within very narrow limits, its maximum, in the best peopled States, not equalling the minimum of inhabitants on an equal space, as given in the first division of the English counties, in a preceding table. Hence, I confess, that though I had fully satisfied myself as to the existence of the principle in question, I hardly supposed it would begin to operate perceptibly in a population so exceedingly scattered as that of America. The contrary is, however, again the fact; and, I think, it will be seen that the law of human increase receives a confirmation from the New World, as to its minute and universal application, which places it henceforth beyond the reach of all cavil and contradiction.

(4) I shall first collect the facts which the earliest regular census of America, that of 1790, presents; in which, however, the classification is less adapted to the purpose I have in view, than that since adopted. The following table is copied from Dr. Seybert's Statistical Annals of America[1].

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[1] Dr. Seybert, Statistical Annals, p. 20.

TABLE LXXII.

DEMONSTRATING THE LAW OF POPULATION, FROM THE FIRST CENSUS OF THE UNITED STATES.

States, &c.	Population on a square Mile.	Area in square Miles.	Population in 1790.	Free White Females.	Free White Males under 16.	Proportion of 1000 Females, to Males under 16.
Western Territory	..	..	36,691	15,365	10,227	
Georgia . .	1.3	62,000	82,548	25,739	14,044	
Kentucky . .	1.8	39,000	73,677	28,922	17,057	
Maine . . .	2.9	32,628	96,540	46,870	24,748	
Under 5 *on a square Mile.*				116,896	66,076	565
New York . .	7.3	46,085	340,120	152,320	78,122	
North Carolina	8.2	48,000	393,751	140,710	77,506	
Vermont . .	8.3	10,237	85,539	40,505	22,328	
Pennsylvania .	9.2	46,800	434,373	206,363	106,948	
South Carolina	9.9	24,080	240,073	56,880	37,722	
From 5 *to* 10.				596,778	322,626	540
Virginia . .	10.6	70,000	747,610	215,056	116,135	
New Hampshire	14.9	9,491	141,885	70,160	34,851	
New Jersey .	22.1	8,320	184,139	73,287	41,416	
Maryland . .	22.8	14,000	319,728	101,395	51,339	
Delaware . .	27.8	2,120	59,094	22,384	12,143	
From 10 *to* 20.				482,282	255,884	530
Rhode Island . *From* 40 *to* 50.	43.5	1,580	68,825	32,652	15,799	482
Connecticut . *From* 50 *to* 60.	50.9	4,674	237,946	117,448	54,403	463
Massachusetts . *From* 60 *to* 70.	60.6	6,250	378,787	190,582	87,289	459

(5) The foregoing table seems to indicate the law of increase with sufficient, and, indeed, striking precision; but as the proofs are founded upon a comparison of very large sections of the population, namely, between the whole of the females and the males under sixteen years of age, and as it may be reasonably supposed that other causes, besides those attributable to a difference in the prolificness of marriages, may have interfered with their relative proportions, I lay less stress upon the results as positive proofs, than, perhaps, they really deserve; and because the following demonstration will be constructed in such a manner as must, I think, entirely obviate all objections whatsoever.

(6) It is a fact universally admitted, that the nubile age of the females of the United States of North America, compared with that in the mother country, is considerably anticipated; and, again, that the period of their prolificness is abridged, so as to terminate more than proportionately earlier. Without accumulating unnecessary proofs of an uncontradicted fact, it may be safely assumed, therefore, that the children under ten years of age are produced by the females from the age of sixteen to forty-five; and in so doing we may be certain that we are correct, to a degree of exactness which must give the utmost possible precision to the argument; for should any deviations occur, they will be very trifling in number, and unquestionably evenly distributed throughout. Now, allowing that for which the advocates for a contrary theory contend so constantly, namely, that the preventive check does not exist in America, or what amounts to the same thing in this discussion, that it operates, if at all, equally; and it must be admitted that a more satisfactory test of the principle for which I am argu-

ing could not possibly be imagined, than that furnished by the American censuses; and the more important, as differing totally from that to which the censuses of the other countries have been submitted, excepting that of Ireland; and, as compared even with the latter, still more conclusive, because founded upon more minute and decisive data. Not very applicable to the purposes of science in other respects, in this particular the divisions of the census of the United States are precisely fitted to our purpose, and invaluable to the argument. Assuming that the females between sixteen and forty-five produce the children under ten, it is found, on examination, that the proportion of the former to the latter has varied in different States in every census: whether that variation conforms to and confirms the law of population promulgated in this treatise is the important question. The following tables, in which, as in the preceding ones, the divisions are classed according to the condensation of the inhabitants, decide this as it regards the United States of America.

TABLE LXXIII.

DEMONSTRATING THE LAW OF POPULATION, FROM THE CENSUS OF 1800, OF THE UNITED STATES.

States, &c.	Area in square Miles.	Population in 1800.	Inhabitants to a square Mile.	Females from 16 to 45.	Children under 10.	Proportion to 100 Females.
Indiana . .	34,000	5,641	.1	817	1,645	
Mississippi .	45,500	8,850	.2	778	1,952	
Ohio . .	40,000	45,365	1.1	7,203	18,006	
Tennessee .	40,000	105,602	2.6	15,546	37,686	
Georgia . .	62,000	162,686	2.6	18,078	37,888	
Maine . .	32,628	151,719	4.7	27,791	54,869	
Kentucky .	39,000	220,959	5.6	30,458	72,223	
N. Carolina .	48,000	478,103	9.9	63,654	122,192	
Under 10 *on the square mile.*				164,325	346,461	210
New York .	46,085	586,050	10.5	104,536	195,570	
Virginia . .	70,000	886,149	12.6	92,955	181,320	
Pennsylvania .	46,800	602,545	12.8	107,820	202,850	
S. Carolina .	24,080	345,591	14.4	35,381	72,075	
Vermont . .	10,237	154,465	15.1	27,893	57,692	
New Hampshire	9,491	183,858	19.4	35,534	60,565	
From 10 *to* 20.				404,119	770,072	190
Maryland .	14,000	353,968	25.2	45,333	72,597	
New Jersey .	8,320	211,149	25.4	36,551	66,522	
From 20 *to* 30.				81,884	139,119	170
Delaware. .	2,120	64,273	30.3	10,524	15,878	
From 30 *to* 40.				10,524	15,878	150
Rhode Island	1,580	69,122	43.7	13,382	19,469	
Connecticut	4,674	251,002	53.7	48,747	73,682	
Massachusetts	6,250	422,845	67.6	84,324	124,566	
Above 40.				146,453	217,717	148

TABLE LXXIV.

DEMONSTRATING THE LAW OF POPULATION FROM THE CENSUS OF 1810, OF THE UNITED STATES.

States, &c.	Area in square Miles.	Population in 1810.	Inhabitants to a square Mile.	Females from 16 to 45.	Children under 10.	Proportion to 100 Females.
Michigan .	164,000	4,762	.03	679	1,440	
Illinois . .	56,122	12,282	.2	1,947	4,285	
Louisiana .	48,220	20,845	.4	2,800	6,651	
Mississippi .	45,500	40,352	1.	3,940	8,232	
Indiana . .	34,000	24,520	2.7	4,108	9,478	
Georgia . .	62,000	252,433	4.	25,831	54,285	
Ohio . . .	40,000	230,760	5.7	39,426	90,815	
Tennessee .	40,000	261,727	6.5	37,488	86,304	
Maine . .	32,628	228,705	7.	42,755	80,404	
Under 10 *on the square mile.*				158,974	341,894	215
Kentucky .	39,000	406,511	10.4	55,431	125,910	
N. Carolina .	48,000	555,500	11.5	71,877	133,457	
Virginia . .	70,000	974,622	13.9	106,062	188,492	
S. Carolina .	24,080	415,115	17.2	39,557	77,156	
Pennsylvania	46,800	810,091	17.3	146,786	270,233	
From 10 *to* 20.				419,713	795,248	189
New York .	46,085	959,049	20.8	170,944	323,878	
Vermont . .	10,237	217,895	21.2	41,775	74,703	
New Hampshire	9,491	214,460	22.6	42,732	66,579	
Maryland .	14,000	380,546	27.1	46,783	74,750	
New Jersey .	8,320	245,562	29.5	42,553	73,866	
From 20 *to* 30.				344,787	613,776	178
Delaware .	2,120	72,674	34.2	11,068	18,673	
From 30 *to* 40.				11,068	18,673	168
Rhode Island	1,580	76,931	48.6	15,155	21,290	
Connecticut .	4,674	261,942	56.	51,266	73,725	
Massachusetts	6,250	472,040	75.	95,595	135,811	
40 *and upwards.*				162,016	230,826	142

(7) Thus is it that the three first censuses of the United States demonstrate the principle of population. Even regarding our own country, when I had become fully convinced of the truth of that principle, I hardly expected that under so great a number of disturbing causes, its operation would be so certain and exact as to adapt itself to variations as small as fifty in the square mile; yet such, as has been seen, is the fact. But that in America the same principle should be regularly apparent in divisions five-fold as minute, excited still greater surprise, as it yet more exceeded my expectation. It may be thought difficult to assign an adequate reason for effects so astonishingly regular, resulting from causes thus minutely varied; the facts, however, admit of no dispute, but as they occur in a part of the world where we are assured no human considerations affect the principle of reproduction, we may the more confidently believe, that they proceed from the undisturbed operations of nature, and therefore prove the principle at issue the more clearly and indisputably. Instead of collecting the proportions educed from the foregoing tables of this chapter, I shall merely direct the reader to their striking and uniform results.

(8) I shall, however, appeal particularly to the last census of the United States, that of 1820, and shall divide it in reference to the condensation of the population still more minutely, not in order to prove more clearly the principle at issue, which it may be hoped is now unnecessary, but for a purpose that will be subsequently explained.

TABLE LXXV.

DEMONSTRATING THE LAW OF POPULATION FROM THE CENSUS OF 1820, OF THE UNITED STATES.

States, &c.	Area in Square Miles.	Population in 1820.	Inhabitants to a Square Mile.	Females from 16 to 45.	Children under 10.	Proportion to 100 Females.
Michigan . .	164,000	8,896	.05	1,287	2,350	
Missouri . .	445,334	66,586	.1	9,341	20,443	
Archansas .	76,961	14,246	.2	2,113	4,562	
Illinois . .	56,122	55,211	1.	9,008	20,112	
Mississippi .	45,500	75,440	1.6	6,898	15,324	
Alabama . .	46,000	127,901	2.8	14,618	32,913	
Louisiana .	48,220	153,407	3.2	12,403	22,879	
Indiana . .	34,000	147,178	4.3	25,644	57,313	
Under 5 *on the square mile.*				81,312	175,896	216
Georgia . .	62,000	340,989	5.4	34,007	68,621	
Maine . .	32,628	298,335	9.	59,071	95,782	
From 5 *to* 10.				93,078	164,403	176
Tennessee .	40,000	422,613	10.5	59,500	131,165	
N. Carolina .	48,000	638,829	13.3	80,322	146,446	
Kentucky .	39,000	564,317	14.4	77,388	160,691	
Ohio . . .	40,000	581,434	14.5	102,134	217,719	
From 10 *to* 15.				319,344	656,021	205
Virginia . .	70,000	1,065,366	15.2	118,406	202,448	
From 15 *to* 20.				118,406	202,448	171
S. Carolina .	24,080	502,741	20.8	44,601	82,549	
Pennsylvania	46,800	1,049,458	22.4	194,749	342,091	
Vermont . .	10,237	235,764	23.	48,396	71,035	
New Hampshire	9,491	244,161	25.7	50,603	70,065	
Maryland .	14,000	407,350	29.1	53,640	80,965	
New York .	46,085	1,372,812	29.7	262,391	439,121	
From 20 *to* 30.				654,380	1,084,926	166
New Jersey .	8,320	277,575	33.3	50,330	81,976	
Delaware .	2,120	72,749	34.3	11,110	17,728	
From 30 *to* 40.				61,440	99,704	162
Rhode Island	1,580	83,059	52.5	17,078	22,447	
Connecticut .	4,674	275,248	58.6	56,274	72,137	
From 50 *to* 60.				73,352	94,584	129
Massachusetts	6,250	523,287	83.7	110,526	133,253	
Above 80.				110,526	133,253	120

(9) The eight results of the last table, deduced from the census of 1820, which it may be reasonably concluded is the most correct, are thus: There have been to every hundred females from sixteen to forty-five years of age, the following proportion of children under ten: where the inhabitants have been, on the square mile

under 5	(the case in 8 of the States)	216
from 5 to 10	(2)	176
10 to 15	(4)	205
15 to 20	(1)	171
20 to 30	(6)	166
30 to 40	(2)	162
40 to 50	none.	none.
50 to 60	(2)	129
60 and upwards	(1)	120

(10) I have divided the twenty-six States and Territories (exclusive of Columbia or the city of Washington) thus minutely, for the very purpose of exhibiting an apparent deviation from the principle advanced, which occurs in the second section, and which need not to have appeared, had the classification been somewhat different. But I purposely introduce and point it out to notice as an example of those many exceptions which, in an inquiry of this nature, must constantly arise, and which, when duly considered and understood, constitute direct proofs of the general rule. The two States in the second line are those of Maine and Georgia. The first of these, it is true, contains a territory of 32,628 square miles, and a population of 298,335 souls; on which the calculation of 9 individuals only on the square mile is made. But how stands the real fact? We are informed, on the best authority, (that of Mr. Warden,) that of this extent, 7578 square miles only are, properly speaking, peopled; the interior, comprising above 25,000, being almost totally

uninhabited, numbering in 1817 only 1500 families[1]. Maine, therefore, being thus rectified, (and none will say that, in reference to the argument, it ought not to be so,) places itself in the fifth line of the above table, or precisely where it should have been in regard to its actual prolificness: so exactly does the principle of population manifest itself, even in its very exceptions, when such are duly examined. The other State, Georgia, it is well known, is similarly circumstanced with Maine, though not in a like degree.

(11) But to obviate the necessity of attending to these individual cases, I shall collect the whole of the decisive facts which the foregoing tables present, and place them at once before the reader. Since the commencement of this century, the rule of increase, then, in America, according to the three last official censuses, has been thus. There have been to every hundred females from sixteen to forty-five years of age, the following proportion of children under ten. Where the inhabitants to the square mile have been,

under 5 (of which there have been	20 instances)	216 children.
from 5 to 10	7	200
10 to 15	11	196
15 to 20	5	181
20 to 25	6	176
25 to 30	7	163
30 to 40	4	160
40 to 50	3	144
50 to 60	4	139
60 and upwards	3	135

(12) It is not in my power still further to illustrate the principle by an appeal to the subdivisions of the States, as has already been done in reference to those of one of the counties of England. Nor is it in the least necessary so to do. I may, however, just refer to the New England States of the Union, distinct from the

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[1] Warden, Statistical Account of the United States, vol. i., p. 350.

others; as in these the inhabitants are supposed to be more stationary, and are certainly of more uniform habits, than in the rest of those composing the Confederation. They corroborate the principle at issue thus minutely:

TABLE LXXVI.

States.	Inhabitants on a square Mile.	Females from 16 to 45.	Children under 10 to each 1000.
Massachusetts . .	83.7	1000	1205
Connecticut . .	58.6	1000	1282
Rhode Island . .	52.5	1000	1314
New Hampshire .	25.7	1000	1384
Maine	9.	1000	1621

(13) Such are the facts contained in the censuses of America,—the very country and the identical documents which have been long supposed to demonstrate the principle of population, which it is the main purpose of this treatise to refute. They utterly subvert that theory by shewing, most indubitably, not merely the fallacy—the impossibility of a geometric ratio of human increase in the United States, independent of foreign accessions; but they demonstrate, at the same time, the existence of the true law of population, and exhibit it in constant operation, where, were it not a principle inherent in Nature, no imaginable reason could be assigned why it should have the least influence. I might also shew that the actual increase in the different divisions of that great confederation follows in the same order as their respective prolificness; but it is unnecessary to prolong this part of an argument, which, I think, would be deemed final and conclusive were it founded solely on the statistics of the United States of America.

CHAPTER XIII.

OF THE LAW OF POPULATION, AS PROVED BY THE CENSUSES OF THE KINGDOM OF THE NETHERLANDS.

(1) The censuses of the kingdom of the Netherlands, as recently published, may be said to embody the main exceptions from the principle of population now promulgated. They will, however, on due examination, be found merely to concentrate those modifications of it which, as previously shewn, resolve themselves into the general rule; exhibiting it in those adaptations which constitute it in all situations, and under all circumstances, a law of uniform and universal beneficence.

(2) It has been already said, that the prolificness of human beings is regulated by the degree of their accumulation, but with a further reference to the nature of the space they occupy. Hence, the kingdom of the Netherlands, consisting, as it does, of a country almost unparalleled in the equability and present fertility of its surface, ought, on a comparison with other countries not possessed of similar advantages, to be eminently prolific; and such appears to be the fact. It has also been stated, that the measure of human fecundity has a direct relation to that of the mortality which prevails in any particular district or country; and the nature and necessity of this regulation, also, is most apparent; as without it the very same degree of fruitfulness might consign one nation to an actual surcharge of inhabitants, and another to inevitable desolation. The country now under considera-

tion is remarkable for exhibiting a variation in the ratio of mortality in its different provinces, perhaps wholly unequalled elsewhere, the extremes being as wide as from 1 death in 31 of the inhabitants, to 1 in about 58; which variation, as has been already mentioned, one of the ablest of its statistical authorities has observed, is coincident with that of the prolificness of the same provinces[1].

(3) It is plain, therefore, that, independently of the difference in those moral causes which, more or less, influence the question, and which exist in the Pays-Bas in their widest extremes, the variations in the physical condition of the population are such as to require a computation of considerable complexity, in order to satisfy the conditions of this highly-important problem. And the attempt, moreover, is rendered still more difficult, though I hope not insuperable, by the known inaccuracies of the official documents; the census being composed of enumerations conducted at various periods and, indeed, under different governments, and, as it seems, supplemented by a series of mere approximations[2]. Imperfect, however, as are these documents, I think, we may deduce from them a striking proof of the true principle of population, and the more important, as shewing that it still pursues and secures its ultimate design, even by means of apparent exceptions from its own general laws. The following facts are taken, principally, from Quetelet.

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[1] Quetelet, Recherches Statistiques sur les Pays-Bas, p. 49.

[2] See M. Quetelet, Recherches sur la Population, &c., pp. 2, 3. And Recherches Statistiques, pp. 4, 5, by the same Author.

TABLE LXXVII.

DEMONSTRATING THE LAW OF POPULATION FROM THE CENSUSES OF THE KINGDOM OF THE NETHERLANDS.

Provinces.	Area in hectares.	Population.	Inhabitants to 100 hectares.	Deaths, 1 in	Births, 1 in	Increase on 100,000 Inhabitants by the excess of births over deaths in 1830.	Marriages, 1 in	Births to each Marriage.	Increase of Population 1830 to 1835.
Zealand . .	158,036	127,659	80	31.4	20.7	1647	114	5.49	.056
N. Holland	229,200	388,425	165	34.5	23.2	1412	104	4.50	.040
S. Holland	227,830	432,054	159	35.0	23.9	1326	113	4.74	.070
Utrecht .	127,617	115,642	90	36.3	24.3	1388	118	4.86	.068
S. Brabant .	307,733	489,602	159	38.2	26.1	1214	142	5.45	.068
W. Flanders	317,422	557,871	175	40.7	27.5	1179	138	5.01	.073
Overyssel .	329,961	158,399	48	43.5	26.5	1475	122	4.60	.071
E. Flanders	298,370	681,489	228	44.8	28.4	1289	165	5.82	.051
Frise . .	260,732	199,335	76	46.1	27.1	1520	129	5.75	.086
Liege . .	282,593	327,161	115	46.2	28.9	1296	154	5.33	.065
Limbourg .	455,316	317,387	69	47.5	29.2	1319	90	3.09	.053
Anvers . .	282,293	318,893	112	48.8	30.7	1208	143	4.65	.056
Groningue .	205,059	153,860	75	49.3	28.9	1432	149	5.47	.078
Hainault .	377,390	538,050	142	51.1	27.4	1694	136	4.98	.073
N. Brabant .	484,896	321,917	66	51.4	29.2	1481	150	5.14	.059
Gueldres .	509,195	285,575	56	53.7	27.6	1761	131	4.75	.069
Luxembourg	626,343	287,786	45	53.8	27.9	1725	150	5.37	.080
Drenthe . .	223,852	52,383	23	55.	27.8	1779	130	4.69	.087
Namur . .	345,610	187,411	54	57.9	29.8	1629	151	5.06	.062

(4) The foregoing table gives the contents in hectares, the population, and its comparative density, as well as the proportion of the births, deaths, and marriages in each of the provinces of the Netherlands; and also the increase calculated, on the difference of the births and deaths, in every 100,000 of the inhabitants. The proportions alluded to, which, as before observed, are extremely various, have plainly a relation to each other; though there is as evidently some other powerful cause, which materially affects that relation, and consequently determines the increase. To develop that cause, is the object of the present inquiry. And, first, it is not the proportion of marriages to the population which occasions the striking difference in the prolificness and increase which appears in the preceding document; or, if it is, it does so in a manner contrary to the suppositions of the anti-populationists. But this, as a fundamental error of their system, will be adverted to hereafter. Nor, second, is it the proportion of births to the population, even, which determines the increase. Thus, if we advert to the sixth and the tenth columns in this table, we shall find, that during five years, where the births are to the population as one in

20—21 inclusive, the increase was	.056
22—23 . . .	.055
24—25 . . .	.068
26—27 . . .	.076
28—29 . . .	.061
30 and upwards . .	.056

It is, therefore, quite clear that the increase is not regulated by the relative proportion of the births merely.

(5) Nothing, then, remains as an adequate cause of these variations (and Nature never acts without one), but that which has been found operative in every country hitherto examined; namely, Space, or the comparative condensation of the population.

If we apply this principle to the facts of a single year, the severest test that can well be imagined, we shall find the proportion of the births and deaths so regulated as clearly to indicate its truth. Thus, adverting to the seventh column of the preceding table, we find that where the annual increase is, on the balance of the births and deaths, upon every 100,000 inhabitants, under 1200, there are, on the average, 175 inhabitants on every 100 hectares; where that increase is from 1200 to 1400, which is the case in seven provinces, there the mean number of individuals, on the same space, is only 133; where the increase is from 1400 to 1600, which occurs in five cases, there the average number is still less, and amounts to barely 86; and lastly, in the six remaining provinces, where the increase is as high as from 1600 to 1800, the population is the thinnest, being at the rate of 75 only. Or, to construct the computation differently. In the three provinces, in which there are less than 50 inhabitants on each 100 hectares, there the increase resulting from the difference between the births and deaths amounts, on the average, to 1659 on every 100,000 of the population; where there are from 50 to 100 individuals on the same space, which is the case in eight provinces, there that increase falls to 1522; where there are from 100 to 150 (of which there are three cases only), to 1399; and, lastly, in the five remaining provinces, where the population is the most dense, there being 150 and upwards on the same extent, there the increase is the least, and amounts, on the average, to 1284 only.

(6) But, to extend the examination to the increase during the five years from 1820 to 1825, as expressed in the last column of the table. The difference in that increase, comparing the least peopled province

Drenthe, with the greatest, East Flanders, is more than 70 per cent.: but to class the whole in five divisions, according to the density of the population in the several provinces, the following are the results; exhibiting a gradation in precise conformity with the principle laid down, and involving a difference, in the increase, of between 50 and 60 per cent.

Inhabitants to 100 hectares.	Number of Provinces.	Mean increase on 6 years.
Under 50	3	.0793
50 to 100	8	.0663
100 to 150	3	.0646
150 to 200	4	.0627
200 and upwards.	1	.0510

(7) These, then, are the results deduced from an examination of the censuses of the kingdom of the Netherlands, which superficial observers have supposed to negative the principle which I have enunciated. On the contrary, they establish a species of proof in its favour, founded even on the very objections which have been urged against it, exhibiting the law of population accomplishing with equal certainty its ultimate designs, when the circumstances under which it operates are the most varied, and so adjusting them into a series of minute and constant adaptations, as still to regulate the increase of human beings by the space they have to possess, and the means provided for their sustentation.

(8) That the average ratio of increase in this or in any other country where the numbers are augmenting, will not be continual, is clear from the universal evidence of the proofs already advanced; to say nothing about that part of such increase as is occasioned by the late improvement in the expectation of human

life, and which must, in its very nature, be temporary. But, in reference to this particular portion of Europe, the most densely peopled of any considerable country upon earth, it may be asked whether any increase whatever does not militate against the general argument advanced in this treatise, which goes to prove the existence of an accurate balance between the numbers of human beings and their means of subsistence? I answer; Certainly not. In the kingdom of the Netherlands, it is true, there are 214 individuals upon the square mile[1], but still at least two-sevenths of the soil are uncultivated; and even as it respects its most densely peopled districts, in some of which there is nearly treble that number on the same space, we are assured that "no country in Europe provides from its soil so great a quantity of sustenance, "not only for its inhabitants, but so large a surplus of "food for exportation, and such valuable commodities "to exchange for articles of foreign growth, as Flanders[2]." But if the principle of population now developed is true, Nature has been too wise and too kind to render any country whatever dependent upon another for the necessaries of life; having so ordained her laws, both physical and moral, that while every nation upon earth has within itself the means of comfortable subsistence to all the population that it contains, or ever shall contain, so by the full development of those means is that population advanced to its utmost degree of happiness and prosperity. The kingdom of the Netherlands, therefore, is still underpeopled, either in reference to its own interests or those of the surrounding nations. Nature is remedying the deficiency, and in the manner which fully demonstrates the true principle of human increase.

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[1] Ency. Brit., Sup., Art. Netherlands, p. 68.

[2] Lowe, Present State, &c., p. 128.

CHAPTER XIV.

OF THE LAW OF POPULATION: AS PROVED BY THE CENSUSES OF THE TOWNS OF ENGLAND AND IRELAND.

(1) THE fourth proof of the principle of population, as regulating the increase of human beings inversely to the condensation of their numbers, was stated to be founded on the comparative prolificness of marriages in towns, in relation to the number of their inhabitants.

(2) I confess, however, that this fact does not seem essential to the general argument, as the inhabitants of towns are not necessarily crowded in proportion to their population and extent; nor are the causes very apparent, why marriages in a place, for example, where there are twenty thousand persons resident, should, on the average, be less prolific than another where there are ten thousand only. Such, however, is the case; and after, having detected this singular law of Nature also, I thought it not only too curious in itself, but far too important to the general argument to be omitted; manifesting, as it does, that there are other powerful, though occult, causes in undoubted operation, beside those which are more obvious and explicable, by which Nature regulates the increase of human beings.

(3) The ensuing table comprises 105 towns of England, being the whole number of those contained in the population abstracts in which the marriages, births, and deaths, are separately given. A few of

these, four or five in number, might have been omitted with advantage to the demonstration, in giving still greater precision and regularity to the results relatively considered; and these omissions the observations in the abstracts themselves would have abundantly justified. But neither in this nor any other instance, when constructing the preceding tables, have I made such exceptions, as I wished wholly to avoid any charge or suspicion of selecting facts to serve a particular purpose. Against the following demonstration no such objection can therefore be taken. I have only to premise that, in classifying the towns among which there has been so great a variation in the increase, I have taken, as the fairest mode, the mean number of the inhabitants in 1811 and 1821; upon which, of course, all the proportions are calculated.

TABLE LXXVIII.

DEMONSTRATING THE LAW OF POPULATION BY THE DIFFERENT PROLIFICNESS OF MARRIAGES IN THE TOWNS OF ENGLAND, AS REGULATED BY THE NUMBER OF THEIR INHABITANTS.—(See Population and Parish Register Abstracts, 1811 and 1821, *passim.*)

	Mean Number of Inhabitants 1810–1821.	Population 1811.	Population 1821.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Burials from 1811 to 1821.	Births to each Marriage.	Marriages to Populat. one in	Baptisms to Populat. one in	Burials to Populat. one in
Wareham . . .	1820	1709	1931	56	262	270	4.67			
Launceston . . .	1970	1758	2183	154	622	368				
Wallingford . . .	1997	1901	2093	122	543	336				
Under 2000.	3967			276	1165	704	4.22	144	34	56
Droitwich . . .	2128	2079	2176	136	827	588				
Lyme Regis . . .	2147	1925	2269	168	668	342				
Blandford . . .	2534	2425	2643	209	649	437				
Huntingdon . . .	2601	2397	2806	206	726	508				
Thetford	2636	2450	2922	199	768	457				
Dorchester . . .	2649	2546	2743	199	584	425				

Shaftesbury	2769	2685	2908	205	764	571				
Marlborough . . .	2808	2579	3038	195	928	553				
Sandwich . . .	2823	2737	2912	218	1048	562				
Maldon	2938	2679	3198	255	812	458				
From 2000 *to* 3000.	26,233			1990	7764	4896	3.90	137	34	53
Guildford . . .	3067	2974	3161	213	1066	642				
Buckingham . . .	3226	2987	3465	273	943	607				
Evesham	3277	3068	3487	224	776	511				
Richmond, Yorkshire	3301	3056	3546	231	1004	561				
Sherborne . . .	3496	3370	3622	243	846	526				
Bridport	3654	3567	3742	345	1216	1101				
Sudbury	3710	3471	3950	303	981	603				
Saffron Walden . .	3778	3403	4154	322	994	620				
Monmouth . . .	3833	3503	4164	257	1000	751				
Harwich	3871	3732	4010	380	1292	997				
Aylesbury . . .	3923	3477	4400	338	1281	751				
Devizes	3979	3750	4208	261	834	626				
From 3000 *to* 4000.	43,115			3390	12,233	8296	3.60	127	35	52

TABLE LXXVIII.—(*continued.*)

	Mean Number of Inhabitants, 1810—1821.	Population 1811.	Population 1821.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Burials from 1811 to 1821.	Births to each Marriage.	Marriages to Populat. one in	Baptisms to Populat. one in	Burials to Populat. one in
St. Alban's . . .	4062	3653	4472	470	1749	1195				
Hertford	4082	3900	4265	242	1236	902				
Peterborough . .	4136	3674	4598	469	1389	844				
Falmouth . . .	4162	3933	4392	563	2000	1251				
Bridgenorth . . .	4365	4386	4345	275	1252	872				
Ludlow	4535	4150	4920	301	1323	935				
Ely	4664	4249	5079	471	1860	1139				
Cirencester . . .	4763	4540	4987	329	1197	847				
Stamford	4816	4582	5050	394	1416	917				
Tewkesbury . . .	4891	4820	4962	465	1208	1059				
Abingdon . . .	4969	4801	5137	490	1283	1022				
From 4000 *to* 5000.	49,615			4469	15,918	10,988	3.56	111	31	45
Bedford	5085	4605	5466	457	1067	1196				

Newbury	5188	4898	5437	264	1446	916
Stafford	5302	4868	5736	485	1876	1237
Bridgewater . . .	5533	4911	6155	491	1982	939
Lichfield	5548	5022	6075	743	1693	1208
Poole	5603	4816	6390	509	1526	971
Weymouth . . .	5677	4732	6622	576	1935	1041
Windsor	5926	6155	5698	534	1933	1181
Newcastle (Lyne) .	6603	6175	7031	193	2331	1556
Lewes	6652	6221	7083	671	1678	1053
Chichester . . .	6893	6425	7362	551	2166	1329
Beverley	7117	6731	7503	471	2384	1471
Winchester . . .	7222	6705	7739	541	2033	1437
Warwick	7366	6497	8235	730	2216	1556
Doncaster . . .	7739	6935	8544	743	2511	1685
Taunton	7765	6997	8534	678	1838	1233
Newark	7660	7236	8084	739	2463	1487
Scarborough . . .	7800	7067	8533	713	1982	1333
Berwick (Tweed) .	8234	7746	8723	365	1252	1642
Hereford	8198	7306	9090	907	2343	1271
Kendal	8249	7505	8984	1032	2980	2622
Durham	8292	6763	9822	691	2714	1907

TABLE LXXVIII.—(*continued.*)

	Mean Number of Inhabitants, 1810—1821.	Population 1811.	Population 1821.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Burials from 1811 to 1821.	Births to each Marriage.	Marriages to Populat. one in	Baptisms to Populat. one in	Burials to Populat. one in
New Sarum . . .	8503	8243	8763	794	2464	2029				
Bury St. Edmund's .	8992	7986	9999	767	2673	1514				
Gloucester . . .	9012	8280	9744	1274	3573	2364				
Kidderminster . .	9373	8038	10,709	967	3115	2434				
Northampton . .	9610	8427	10,793	1021	2423	1885				
Lincoln	9614	8861	10,367	820	3061	1994				
Lancaster . . .	9695	9247	10,144	1395	3886	2631				
Dover	9700	9074	10,327	1016	3946	2289				
From 5000 *to* 10,000.	224,101			21,238	69,485	47,320	3.27	105	32	47
Maidstone . . .	**10,975**	**9,443**	**12,508**	**1150**	**4440**	**2481**				
King's Lynn . . .	**11,256**	**10,259**	**12,253**	**1085**	**4009**	**2828**				
Whitehaven . . .	**11,294**	**10,106**	**12,483**	**1128**	**4451**	**2762**				
Canterbury . . .	**11,472**	**10,200**	**12,745**	**1218**	**4457**	**2206**				

Reading	11,336	10,788	12,867	1258	3387	2456				
Cambridge	12,625	11,108	14,142	1081	3548	2728				
Colchester	13,280	12,544	14,016	1420	3893	2751				
Sunderland	13,507	12,289	14,725	1407	4715	4156				
Carlisle	14,033	12,531	15,476	1281	4735	3643				
Oxford	14,648	12,931	16,364	1629	4464	2957				
Derby	15,233	13,043	17,423	2250	4952	3029				
Worcester	15,410	13,814	17,023	2475	5269	3493				
Ipswich	15,428	13,670	17,186	1716	4412	2899				
Wigan	15,888	14,060	17,716	2411	7426	4182				
Woolwich	17,031	17,054	17,008	701	7082	6222				
Yarmouth	18,008	17,977	18,040	1803	6412	3852				
Chester	18,049	16,140	19,949	3440	6192	4563				
Brighton	18,220	12,012	24,429	1883	5359	3140				
Shrewsbury	19,072	18,543	19,602	1991	5808	4458				
York	19,502	18,217	20,787	1984	6092	4486				
Coventry	19,582	17,923	21,242	2175	6692	4563				
From 10,000 *to* 20,000.	327,826			36,418	111,029	77,528	3.04	90	30	42

Table LXXVIII.—(*continued.*)

	Mean Number of Inhabitants, 1810—1821.	Population 1811.	Population 1821.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Burials from 1811 to 1821.	Births to each Marriage.	Marriages to Populat. one in	Baptisms to Populat. one in	Burials to Populat. one in
Exeter	21,187	18,896	23,479	2382	5,497	4426				
Leicester	26,653	23,146	30,125	3150	8,494	5901				
Hull	27,691	26,792	28,591	3084	7,408	6779				
Chatham & Rochester	31,148	21,722	40,574	3000	8,653	6847				
Newcastle (Tyne) .	31,384	27,587	35,181	4081	10,729	4552				
Bath	34,143	31,496	36,811	4136	9,061	6587				
Nottingham . . .	37,334	34,253	40,415	4064	11,941	8662				
Deptford & Greenwich	38,677	36,780	40,574	2023	12,032	9415				
Portsmouth . . .	43,108	40,567	45,648	6519	18,049	11539				
Norwich	43,772	37,256	43,772	4760	13,292	9909				
From 20,000 *to* 50,000.	335,097			37,199	105,156	74,617	2.82	90	32	44
Plymouth . . .	58,636	56,060	61,212	9685	23,646	15,586				
Leeds	73,165	62,534	83,796	7445	22,908	15,244				

From 50,000 *to* 100,000.	310,194			40,842	98,261	69,996	2.40	76	32	44
Liverpool . . .	106,674	94,376	118,972	13,810	40,989	27,681				
Manchester . . .	116,180	98,573	133,788	18,258	31,530	16,663				
Metropolis . . .	1,117,620	1,009,546	1,225,694	120,605	284,897	233,310				
100,000 *and upwards*.	1,340,474			152,673	357,416	277,654	2.34	87	37	48
TOTALS . .	2,662,442			298,551	778,684	572,264	2.61	89	34	46

(4) Such is the irrefragable demonstration which the towns of England afford to the principle of population. It may, indeed, be possibly objected that some of them, separately considered, exhibit considerable deviations from the general proportions. It is admitted: and the reader's attention is purposely called to such instances; for it will be found that, wherever the necessary information can be obtained respecting them, they instantly afford so many confirmations of the main position advanced. Had these exceptions been excluded or properly rectified, the preceding tables would, I am fully convinced, have assumed the exactness of a mathematical demonstration; but I am aware that this mode would have laid the proof open to the objection (often a valid one) of being formed of a series of mere selections, to the rejection of every fact which did not suit the argument: a practice which is frequently pursued with great ingenuity and too much success. Several of the instances of these deviations might be advanced, were it necessary. Woolwich, for example, is far too prolific, and indeed, according to the abstracts, impossibly so, but this error originates in the fact of the marriages in the vicinity of London being often celebrated in that city; which circumstance also gives the prolificness of marriages in the towns, and even counties adjacent to the metropolis, too high. The same observation applies to Greenwich and Deptford, and other places similarly situated. Adverting to the last divisions of the table, to which the reader's attention will probably be particularly directed, in that class which comprehends the towns having from 50,000 to 100,000 inhabitants, considerable differences will be found in the proportion in question, if they be individually examined. Bristol, for instance, will give only 159 baptisms to 100 marriages, whereas the same

proportion in Leeds is as high as 307. But it is well known that many couples are married in Bristol who reside in adjacent parishes: a fact which is recognized in the abstracts, lessening, therefore, the apparent fecundity of marriages in that city; whereas, on the contrary, a considerable proportion of the population of Leeds belongs to the country jurisdiction of that borough, and consequently, on the principle contended for, the fecundity of marriages ought to rise higher there than would be the case were the whole population inclosed in the town properly so called. Such is the fact. Again, in the last division in the table, Manchester seems somewhat misplaced; but that would be rectified were the omissions in the baptisms, as explained in the published abstract of the registers, taken into the account. The city of Lichfield, in the sixth division, seems less fruitful of births, in proportion to the marriages, than it ought to be; but this also is explained by the circumstance, that the marriages of the county of that city are usually celebrated there, while the baptisms are sometimes solemnized in another hundred. Chester also appears too sterile; but marriages from Flintshire, which are constantly taking place in that city, fully account for it. Beverley, on the contrary, seems too fruitful; but this, I understand, is explained by a contrary fact, namely, that many of the marriages which belong to that place are celebrated at Hull. I might greatly extend these remarks, were it necessary; but, in the foregoing table, it has been seen, that I have availed myself of no exceptions whatever, in order to avoid the cavil it would have occasioned had I done so; and, indeed, wherever the facts are sufficiently numerous, such a course is unnecessary. These differences, however, prove the importance of establishing our conclusions upon averages formed from a sufficient number of facts; when the probabilities are that the variations amongst them will become reciprocally balanced.

(5) It may not be unnecessary, in further illustration and confirmation of the principle laid down, to add to this table another, shewing the same proportions in the most thinly populated districts of the kingdom. In constructing this, the reader may rest assured, that in no cases were selections made of those parts which were the most fecund, but upon the fairer principle of taking the hundred, wapentake, or division from each of the counties which appeared the least densely peopled; and in the absence of a better guide to determine this point, taking those where the number of agricultural families, as specified in the abstracts, was the largest in proportion to the whole number of inhabitants. It was inferred, that where this proportion was greatest, there the largest space of ground must be covered by the same number of inhabitants; the very nature of that avocation seeming to secure a tolerably correct conclusion in this respect. The table, thus collected, is as follows:

Shewing the Prolificness of Marriages of the most thinly-peopled Hundred or Wapentake, in each of the Counties of England.

(*See the Population and Parish Register Abstracts*, 1811 *and* 1821.)

COUNTY.	Hundred, Wapentake, &c.	Mean Number of Inhabitants 1810, 1820.	Population in 1810.	Population in 1820.	Marriages from 1810 to 1820.	Baptisms from 1810 to 1820.	Burials from 1810 to 1820.	Proportion of Marriages to Baptisms, 1 to	Proportion of Baptisms to Population, 1 to	Proportion of Burials to Population, 1 to	Proportion of Marriages to Population, 1 to
Bedfordshire .	Stodden . .	4656	4263	5050	378	1258	722				
Berkshire . .	Compton . .	2259	2212	2307	147	740	396				
Buckingham .	Ashendon . .	11,484	10,965	12,003	879	3672	1969				
Cambridge .	Northstow . .	3155	2853	3457	265	1035	495				
Chester . . .	Broxton . .	14,687	13,651	15,723	653	4370	2389				
Cornwall . .	Lesnewth . .	6973	6466	7481	504	2027	903				
Cumberland .	Eskdale . .	20,832	19,379	22,286	1118	5949	3515				
Derby . . .	Repton . .	16,098	15,223	16,973	930	4569	2349				
Devon . . .	Shirwell . .	3531	3275	3787	224	1011	423				
Dorset . . .	Sherborne . .	5999	5644	6354	420	1767	1007				
Durham . . .	Stockton Ward, S.	17,184	16,165	18,203	1148	4926	3053				

TABLE LXXVIII.—(*continued.*)

	Mean Number of Inhabitants, 1810—1821.	Population 1811.	Population 1821.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Burials from 1811 to 1821.	Births to each Marriage.	Marriages to Populat. one in	Baptisms to Populat. one in	Burials to Populat. one in
St. Alban's . . .	4062	3653	4472	470	1749	1195				
Hertford	4082	3900	4265	242	1236	902				
Peterborough . .	4136	3674	4598	469	1389	844				
Falmouth . . .	4162	3933	4392	563	2000	1251				
Bridgenorth . . .	4365	4386	4345	275	1252	872				
Ludlow	4535	4150	4920	301	1323	935				
Ely	4664	4249	5079	471	1860	1139				
Cirencester . . .	4763	4540	4987	329	1197	847				
Stamford	4816	4582	5050	394	1416	917				
Tewkesbury . . .	4891	4820	4962	465	1208	1059				
Abingdon . . .	4969	4801	5137	490	1283	1022				
From 4000 *to* 5000.	49,615			4469	15,918	10,983	3.56	111	31	45
Bedford	5035	4605	5466	[illegible]	[illegible]	[illegible]				

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
Stafford	5302	4868	5786	485	1876	1237				
Bridgewater	5533	4911	6155	491	1982	939				
Lichfield	5548	5022	6075	743	1693	1208				
Poole	5603	4816	6390	509	1526	971				
Weymouth	5677	4732	6622	576	1935	1041				
Windsor	5926	6155	5698	534	1933	1181				
Newcastle (Lyne)	6603	6175	7031	193	2331	1556				
Lewes	6652	6221	7083	671	1678	1053				
Chichester	6893	6425	7362	551	2166	1329				
Beverley	7117	6731	7503	471	2384	1471				
Winchester	7222	6705	7739	541	2033	1437				
Warwick	7366	6497	8235	730	2216	1556				
Doncaster	7739	6935	8544	743	2511	1685				
Taunton	7765	6997	8534	678	1838	1233				
Newark	7660	7236	8084	739	2463	1487				
Scarborough	7800	7067	8533	713	1982	1333				
Berwick (Tweed)	8234	7746	8723	365	1252	1642				
Hereford	8198	7306	9090	907	2343	1271				
Kendal	8249	7505	8984	1032	2980	2622				
Durham	8292	6763	9822	691	2714	1907				

TABLE LXXVIII.—(*continued.*)

	Mean Number of Inhabitants, 1810—1821.	Population 1811.	Population 1821.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Burials from 1811 to 1821.	Births to each Marriage	Marriages to Populat. one in	Baptisms to Populat. one in	Burials to Populat. one in
New Sarum . . .	8503	8243	8763	794	2464	2029				
Bury St. Edmund's .	8992	7986	9999	767	2673	1514				
Gloucester . . .	9012	8280	9744	1274	3573	2364				
Kidderminster . .	9373	8038	10,709	967	3115	2434				
Northampton . .	9610	8427	10,793	1021	2423	1885				
Lincoln	9614	8861	10,367	820	3061	1994				
Lancaster . . .	9695	9247	10,144	1395	3886	2631				
Dover	9700	9074	10,327	1016	3946	2289				
From 5000 *to* 10,000.	224,101			21,238	69,485	47,320	3.27	105	32	47
Maidstone . . .	10,975	9,443	12,508	1150	4440	2481				
King's Lynn . . .	11,256	10,259	12,258	1085	4009	2828				
Whitehaven . . .	11,294	10,106	12,483	1128	4451	3763				
Canterbury . . .	11,478	10,200	12,745	1218	4457	2906				

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
Reading	11,386	10,788	12,867	1258	2997	2456				
Cambridge	12,625	11,108	14,142	1081	3548	2728				
Colchester	13,280	12,544	14,016	1420	3893	2751				
Sunderland	13,507	12,289	14,725	1407	4715	4156				
Carlisle	14,033	12,531	15,476	1281	4735	3643				
Oxford	14,648	12,931	16,364	1629	4464	2957				
Derby	15,233	13,043	17,423	2250	4952	3029				
Worcester	15,410	13,814	17,023	2475	5269	3493				
Ipswich	15,428	13,670	17,186	1716	4412	2899				
Wigan	15,888	14,060	17,716	2411	7426	4182				
Woolwich	17,031	17,054	17,008	701	7082	6222				
Yarmouth	18,008	17,977	18,040	1803	6412	3852				
Chester	18,049	16,140	19,949	3440	6192	4563				
Brighton	18,220	12,012	24,429	1883	5359	3140				
Shrewsbury	19,072	18,543	19,602	1991	5808	4458				
York	19,502	18,217	20,787	1984	6092	4486				
Coventry	19,582	17,923	21,242	2175	6692	4563				
From 10,000 *to* 20,000.	327,826			36,418	111,029	77,528	3.04	90	30	42

TABLE LXXVIII.—(*continued.*)

	Mean Number of Inhabitants, 1810—1821.	Population 1811.	Population 1821.	Marriages from 1811 to 1821.	Baptisms from 1811 to 1821.	Burials from 1811 to 1821.	Births to each Marriage.	Marriages to Populat. one in	Baptisms to Populat. one in	Burials to Populat. one in
Exeter	21,187	18,896	23,479	2382	5,497	4426				
Leicester	26,653	23,146	30,125	3150	8,494	5901				
Hull	27,691	26,792	28,591	3084	7,408	6779				
Chatham & Rochester	31,148	21,722	40,574	3000	8,653	6847				
Newcastle (Tyne) .	31,384	27,587	35,181	4081	10,729	4552				
Bath	34,143	31,496	36,811	4136	9,061	6587				
Nottingham . . .	37,334	34,253	40,415	4064	11,941	8662				
Deptford & Greenwich	38,677	36,780	40,574	2023	12,032	9415				
Portsmouth . . .	43,108	40,567	45,648	6519	18,049	11539				
Norwich	43,772	37,256	43,772	4760	13,292	9909				
From 20,000 *to* 50,000.	335,097			37,199	105,156	74,617	2.82	90	32	44
Plymouth . . .	58,636	56,060	61,212	9685	23,646	15,586				
Leeds	73,165	62,534	83,796	7445	22,905	15,244				

Birmingham	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
From 50,000 *to* 100,000.	310,194			40,842	98,261	69,996	2.40	76	32	44
Liverpool . . .	106,674	94,376	118,972	13,810	40,989	27,681				
Manchester . . .	116,180	98,573	133,788	18,258	31,530	16,663				
Metropolis . . .	1,117,620	1,009,546	1,225,694	120,605	284,897	233,310				
100,000 *and upwards.*	1,340,474			152,673	357,416	277,654	2.34	87	37	48
TOTALS . .	2,662,442			298,551	778,684	572,264	2.61	89	34	46

(4) Such is the irrefragable demonstration which the towns of England afford to the principle of population. It may, indeed, be possibly objected that some of them, separately considered, exhibit considerable deviations from the general proportions. It is admitted: and the reader's attention is purposely called to such instances; for it will be found that, wherever the necessary information can be obtained respecting them, they instantly afford so many confirmations of the main position advanced. Had these exceptions been excluded or properly rectified, the preceding tables would, I am fully convinced, have assumed the exactness of a mathematical demonstration; but I am aware that this mode would have laid the proof open to the objection (often a valid one) of being formed of a series of mere selections, to the rejection of every fact which did not suit the argument: a practice which is frequently pursued with great ingenuity and too much success. Several of the instances of these deviations might be advanced, were it necessary. Woolwich, for example, is far too prolific, and indeed, according to the abstracts, impossibly so, but this error originates in the fact of the marriages in the vicinity of London being often celebrated in that city; which circumstance also gives the prolificness of marriages in the towns, and even counties adjacent to the metropolis, too high. The same observation applies to Greenwich and Deptford, and other places similarly situated. Adverting to the last divisions of the table, to which the reader's attention will probably be particularly directed, in that class which comprehends the towns having from 50,000 to 100,000 inhabitants, considerable differences will be found in the proportion in question, if they be individually examined. Bristol, for instance, will give only 159 baptisms to 100 marriages, whereas the same

proportion in Leeds is as high as 307. But it is well known that many couples are married in Bristol who reside in adjacent parishes: a fact which is recognized in the abstracts, lessening, therefore, the apparent fecundity of marriages in that city; whereas, on the contrary, a considerable proportion of the population of Leeds belongs to the country jurisdiction of that borough, and consequently, on the principle contended for, the fecundity of marriages ought to rise higher there than would be the case were the whole population inclosed in the town properly so called. Such is the fact. Again, in the last division in the table, Manchester seems somewhat misplaced; but that would be rectified were the omissions in the baptisms, as explained in the published abstract of the registers, taken into the account. The city of Lichfield, in the sixth division, seems less fruitful of births, in proportion to the marriages, than it ought to be; but this also is explained by the circumstance, that the marriages of the county of that city are usually celebrated there, while the baptisms are sometimes solemnized in another hundred. Chester also appears too sterile; but marriages from Flintshire, which are constantly taking place in that city, fully account for it. Beverley, on the contrary, seems too fruitful; but this, I understand, is explained by a contrary fact, namely, that many of the marriages which belong to that place are celebrated at Hull. I might greatly extend these remarks, were it necessary; but, in the foregoing table, it has been seen, that I have availed myself of no exceptions whatever, in order to avoid the cavil it would have occasioned had I done so; and, indeed, wherever the facts are sufficiently numerous, such a course is unnecessary. These differences, however, prove the importance of establishing our conclusions upon averages formed from a sufficient number of facts; when the probabilities are that the variations amongst them will become reciprocally balanced.

(5) It may not be unnecessary, in further illustration and confirmation of the principle laid down, to add to this table another, shewing the same proportions in the most thinly populated districts of the kingdom. In constructing this, the reader may rest assured, that in no cases were selections made of those parts which were the most fecund, but upon the fairer principle of taking the hundred, wapentake, or division from each of the counties which appeared the least densely peopled; and in the absence of a better guide to determine this point, taking those where the number of agricultural families, as specified in the abstracts, was the largest in proportion to the whole number of inhabitants. It was inferred, that where this proportion was greatest, there the largest space of ground must be covered by the same number of inhabitants; the very nature of that avocation seeming to secure a tolerably correct conclusion in this respect. The table, thus collected, is as follows:

SHEWING THE PROLIFICNESS OF MARRIAGES OF THE MOST THINLY-PEOPLED HUNDRED OR WAPENTAKE, IN EACH OF THE COUNTIES OF ENGLAND.

(*See the Population and Parish Register Abstracts*, 1811 *and* 1821.)

COUNTY.	Hundred, Wapentake, &c.	Mean Number of Inhabitants 1810, 1820.	Population in 1810.	Population in 1820.	Marriages from 1810 to 1820.	Baptisms from 1810 to 1820.	Burials from 1810 to 1820.	Proportion of Marriages to Baptisms, 1 to	Proportion of Baptisms to Population, 1 to	Proportion of Burials to Population, 1 to	Proportion of Marriages to Population, 1 to
Bedfordshire .	Stodden . .	4656	4263	5050	378	1258	722				
Berkshire . .	Compton . .	2259	2212	2307	147	740	396				
Buckingham .	Ashendon . .	11,484	10,965	12,003	879	3672	1969				
Cambridge .	Northstow . .	3155	2853	3457	265	1035	495				
Chester . . .	Broxton . .	14,687	13,651	15,723	653	4370	2389				
Cornwall . .	Lesnewth . .	6973	6466	7481	504	2027	903				
Cumberland .	Eskdale . .	20,832	19,379	22,286	1118	5949	3515				
Derby . . .	Repton . .	16,098	15,223	16,973	930	4569	2349				
Devon . . .	Shirwell . .	3531	3275	3787	224	1011	423				
Dorset . . .	Sherborne . .	5999	5644	6354	420	1767	1007				
Durham . . .	Stockton Ward, S.	17,184	16,165	18,203	1148	4926	3053				

TABLE LXXVII.—(*continued*).

COUNTY.	Hundred, Wapentake, &c.	Mean number of Inhabitants, 1810—1820.	Population in 1810.	Population in 1820.	Marriages from 1810 to 1820.	Baptisms from 1810 to 1820.	Burials from 1810 to 1820.	Proportion of Marriages to Baptisms, 1 to	Proportion of Baptisms to Population, 1 to	Proportion of Burials to Population, 1 to	Proportion of Marriages toPopulation, 1 to
Essex	Freshwell . .	5788	5372	6205	444	1634	928				
Gloucester . .	Bradley . .	4557	4243	4872	287	1365	734				
Hereford . .	Ewyasley . .	3319	3257	3381	184	737	517				
Hertford . .	Edwinstree .	8097	7524	8670	506	2565	1399				
Huntingdon .	Normancross .	7723	7427	8020	678	2643	1451				
Kent	Shipway, Isle .	24,150	22,881	25,420	1907	8873	4494				
Lancashire . .	Lonsdale, SS. .	18,249	16,903	19,596	871	5336	2577				
Leicester . .	Framland . .	14,125	12,936	15,314	958	4555	2340				
Lincoln . . .	Alascoe . .	3939	3645	4234	825	1239	601				
Middlesex . .	Gore	9270	8738	9806	376	2538	1921				
Monmouth . .	Ragland . .	6888	6565	7211	347	1891	1053				
Norfolk . . .	Freebridge, Lynn	9685	8834	10,537	787	3353	1743				

Rutland . . .	Alstoe . . .	3864	3563	4165	278	1254	654				
Salop	Munslow . .	9924	9370	10,478	693	3092	1704				
Somerset . .	Somerton . .	4587	4303	4871	315	1452	817				
Hants . . .	Kingsclere . .	15,110	13,861	16,359	1078	4808	2554				
Stafford . . .	Cuttlestone .	22,241	21,055	23,427	1169	6848	3816				
Suffolk . . .	Thingoe . .	5498	5273	5724	420	1799	884				
Surrey . . .	Blackheath .	7154	6597	7712	519	2300	1163				
Sussex . . .	Lewes, Rape .	20,116	18,659	21,573	1369	6502	3152				
Warwick . .	Kington . .	20,805	19,459	22,151	1404	6456	3606				
Westmoreland	West Ward .	6960	6604	7316	443	2199	1176				
Wilts	Chalk . . .	2735	2552	2918	172	863	424				
Worcester . .	Blackenhurst .	3102	2991	3213	198	918	503				
York, E. R. .	Holderness, N. & S.	13,629	12,675	14,584	869	4731	2223				
York, N. R. .	Hallikeld . .	5797	5636	5958	279	1395	785				
York, West .	Barkstone Ash	19,374	17,976	20,772	1340	6491	3499				
		409,228			26,375	125,982	68,304	4.77	32	60	155

(6) The important results which the preceding tables establish are these. In the rural divisions of the country, where the population is sparingly disseminated, and agriculture mainly prevails, the average annual proportion of marriages to baptisms are

			as 100 to 477
In towns, under	1900 inhabitants,	(1)	100 to 467
from	1900 to 2000	(2)	100 to 422
	2000 to 3000	(10)	100 to 390
	3000 to 4000	(12)	100 to 360
	4000 to 5000	(11)	100 to 356
	5000 to 10,000	(30)	100 to 327
	10,000 to 20,000	(22)	100 to 304
	20,000 to 50,000	(10)	100 to 282
	50,000 to 100,000	(4)	100 to 240
	100,000 and upwards	(3)	100 to 234

Such is the irrefragable evidence which the registers of the towns of England bear to the true principle of population.

(7) I am not aware that there are series of published facts, of a similar nature, regarding the towns of any other countries, which would enable us to extend the present proof, were it necessary to do so. We have seen, indeed, that where the censuses are divided into ages, as in America and Ireland, the argument may be pursued by a different method, and with at least equal success. But, in the censuses of the former country the towns are not particularized, and in the latter, there are only eight towns and cities of exempt jurisdiction, concerning which the facts necessary to the present inquiry are given; far too small a number to render what has been urged respecting the necessity of establishing general principles on the average of a sufficient number of cases, applicable. Let us, however, venture to examine whether even these do not, in some degree, indicate the truth of the

principle so fully demonstrated by a reference to the towns of this sister island.

TABLE LXXX.

EXHIBITING THE COMPARATIVE PROLIFICNESS OF THE EIGHT TOWNS AND CITIES OF IRELAND, THE POPULATION OF WHICH IS SEPARATELY GIVEN IN THE CENSUS OF 1821.

Towns and Cities.	Population in 1821.	Inhabitants between 15 and 40.	Children under 10.	Proportion to every 1000.
Carrickfergus . . .	8023	3155	2298	737.7
Drogheda	18,118	7609	4726	621.1
Kilkenny	23,230	9877	6053	612.9
Galway	27,775	12,092	7359	608.6
Waterford	28,679	12,329	7447	604.0
Limerick	59,045	26,089	15,604	598.1
Cork	100,658	43,515	25,894	595.0
Dublin	185,881	89,952	42,321	470.4

(8) The regularity of the proofs elicited in the preceding table, founded as they are upon single instances, surpassed, I confess, my anticipation; though prepared, by the preceding tables, confidently to expect an unequivocal indication of the truth of the general principle. They exceed in exactness those exhibited by the towns of England if individually examined. But this, when duly considered, is accounted for by the fact, that those variations in the apparent prolificness of the latter, resolvable into some peculiarity of jurisdiction, local custom, or other irregu-

larity, affecting the registers of marriages and baptisms, do not influence the results deduced from an actual enumeration and classification of the existing inhabitants. Hence arises the precision with which the towns of Ireland arrange themselves, conformably to the present argument.

(9) Before I enter upon a different branch of the general argument, I will pause to ask, whether the truth of the main position is not already abundantly established? If the proofs adduced in this and the preceding chapters are not sufficient to place this great and important principle of Nature beyond the reach of doubt or contradiction, can any facts, however striking, numerous, and uniform, relating to any subject whatever, be regarded as amounting to demonstration?

CHAPTER XV.

OF THE LAW OF POPULATION. PROVED BY THE EFFECTS OF AN INCREASE OF INHABITANTS ON HUMAN PROLIFICNESS IN DIFFERENT COUNTRIES.

(1) HAVING, I trust, demonstrated the law of population as at present expounded, and shewn that it is in actual operation, by an appeal to the comparative prolificness of different countries, and likewise to the several divisions of each; I proceed to another branch of the general argument, and shall now shew that in the same countries and districts such prolificness has, in precise conformity to the principle propounded, varied at different periods as their population has fluctuated. Hitherto the argument has had reference to space only: in pursuing it historically, time will give its seal to the demonstration.

(2) The difficulty attending this part of the subject, however, is too obvious to be overlooked. A considerable one has been already encountered, in the paucity of statistical documents regarding the present movements of the population in most countries; and as we go farther back, it is but reasonable to suppose that these documents will become still fewer in number, and more deficient in correctness. Sufficient materials may nevertheless be gleaned, wherewith to construct an argument in favour of the theory advanced, which, I think, it would not be very easy to overturn, even were there no other and more direct proofs in its favour.

(3) Let us, therefore, now inquire whether, under

otherwise equal circumstances, the prolificness of marriages has not, in the same countries and districts, diminished as their population has advanced.

(4) I say, "under otherwise equal circumstances;" for, as it forms an essential part of my argument, to shew that growing numbers have hitherto been the great means of diffusing increasing plenty in every community, and, on the contrary, that "fewness of people" has ever been accompanied by real poverty and destitution; so some past period in the history of a country might possibly be selected, when its population has been so irresistibly checked by tyranny, or abject wretchedness, as to place the principle of prolificness under restraints that would make it physically impossible that the natural increase of the species should be developed. Few instances, however, of this kind will, I think, be discovered in any population at all civilized; the laws of Nature, which operate to rescue mankind from wretchedness by increasing their numbers, being generally too powerful to be easily withstood. I may add that certain national events must, under any possible circumstances, have a very considerable effect on the fecundity of marriages, and especially wars, for reasons perfectly apparent. Spartan story affords us a striking evidence of this fact; but it is unnecessary to travel beyond our own shores, or out of our own times, in proof of it. The effect which the return of peace has had, at the three several times when that event has occurred, since the period at which the annual registers of England, now published, commence, is strikingly conclusive upon this point, as is shewn elsewhere. These explanations are the result of no after-thoughts, dictated by the straits into which it may be supposed the argument would otherwise be pushed: on the contrary, they are clearly

implied by the terms in which the proposition is necessarily and constantly qualified.

(5) To pursue the present inquiry in the same order as the preceding one, I commence with England. I am not aware of any author who has given the average prolificness of marriages in this country before Gregory King, whose industrious and accurate habits peculiarly qualified him for those statistical inquiries, which he pursued with so much eagerness. There is little doubt that his statements may be far more safely relied upon than many of those which profess to be derived from authentic documents. His calculation of the proportion of marriages and births in different situations in England has, I think, been rarely disputed, and it enables us to extend the comparison about to be made to a distance of a century and a half: —a period, the length of which is important to the argument, as it exhibits the population in a very different state in point of numbers, and presents the proof as founded on the average results of sufficiently remote periods.

TABLE LXXXI.

SHEWING THE ESTIMATED PROLIFICNESS OF MARRIAGES IN ENGLAND, AT THE CLOSE OF THE SEVENTEENTH CENTURY.

Places.	Number of Inhabitants.	One Annual Marriage, to	Number of Marriages.	Children to one Marriage.	Total Number of Births.
London . .	530,000	106	5,000	4.	20,000
Large Towns .	870,000	128	6,800	4.5	30,600
Small Towns & Country Places	4,100,000	141	29,200	4.8	140,160
	5,500,000	134	41,000	4.65	190,760

(6) The next computation as to the comparative prolificness of marriages in this country, is in Dr. Short's work, where he has presented us with the fruits of his great and persevering industry, in a series of tables containing the births, marriages, and deaths, of a considerable number of places, dividing them into two periods; the former of which, as going back into the sixteenth century, when the registers were notoriously incorrect, and more especially those of the marriages and births, cannot, perhaps, be much depended upon. The second period, however, is not open to this objection, at least to a similar extent; and ending, as it generally does, at about the close of the first third part of the eighteenth century, may properly enough exhibit the result we are in search of, at the second stage of our inquiry, namely, about half a century after the date of Gregory King's document. According to Short, the prolificness of marriages had then considerably abated, both in towns and country; as he gives it in the latter at about 4⅓ each, and in the former, as less than four children each.

(7) We shall now take up the inquiry, guided in some measure by the documents published in the Population Abstracts; and even in these, we regret to say that much uncertainty necessarily prevails. Marriages, it is true, in consequence of an act of parliament which took effect in 1754, may be regarded as correctly given; not so, however, the births. It may be stated, on the authority of Mr. Rickman, that the improvement in the registers from that period to the present time has been progressive, referring, of course, to baptisms and burials only; and these again can only have been less perfectly given in the more early parts of the published registers, by errors of omission. It follows, therefore, that in the former of the periods about to be particularized, compared with

the latter ones, the marriages appear less prolific than they actually were; or, to speak more precisely, the comparative degree of fecundity assigned to them is less in the former, and greater in the latter, than it ought to be. Another important fact must not be omitted. The number of illegitimate births, which, owing to the more crowded state of the population in many parts of the country, and from other causes, relating to the nature of the employment being so materially altered, has, unquestionably, gradually and greatly augmented during the latter half of the term in question; increasing, consequently, the proportion of fecundity assigned in these tables to the marriages; there being, unfortunately, no separate column specifying the number of these, as there is in France, which would have given us an opportunity of rectifying the error. Lastly, it is a matter of doubt whether those bodies of dissenters, which regularly celebrate their baptisms in their own chapels, have not, on the whole, relatively to the amount of the population, decreased. Dr. Price, indeed, confidently asserted that they had considerably diminished. As to the most numerous body of separatists, the Wesleyan Methodists, they are still in the habit of baptizing and burying at the churches, at least such was their practice up to the period when the present inquiry will terminate, namely, 1811.

(8) The births and marriages from 1810 to 1820 are excluded from the ensuing table, for the reason Mr. Rickman intimates; namely, because the increased proportion of the former "arises from the parish "register act of 1812, under which private baptisms "are more frequently registered than heretofore[1]," to which may be added another, and still more important reason,—the return of general peace during this in-

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[1] Rickman, Population Abstract, Prelim. Ob., p. xxvii., &c.

terval; which had the effect of reuniting many scores of thousands of married couples, most of them in the prime of their existence. Even the peace of Amiens, short as it proved, had no slight effect upon the fertility of the marriages at the period when it took place. Without any further remarks, I give the following table; as constructed by Mr. Rickman, with the exception of his last item.

TABLE LXXXII.

SHEWING THE AVERAGE PROLIFICNESS OF THE MARRIAGES OF ENGLAND, DURING HALF A CENTURY, VIZ., FROM 1760 TO 1810[1].

Periods.	Marriages.	Baptisms.	Average.
1760	100	366	361
1770	100	361	
1780	100	356	
1785	100	366	359
1790	100	359	
1795	100	353	
1800	100	340	350
1805	100	350	
1810	100	360	

(9) This diminution in the proportions of baptisms to marriages, under the cirumstances already noticed, and especially as we are given to understand that the registers, as it regards the baptisms, have been "progressively improving" in correctness, seems a very decisive proof of the principle in question, as it

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[1] Rickman, Population Abstracts, Prelim. Obs., p. xxviii.

regards England. The facts already advanced are, when collected, as follows:

TABLE LXXXIII.

SHEWING THE DIMINISHING FECUNDITY OF MARRIAGES IN ENGLAND, AS ITS POPULATION HAS INCREASED.

Periods.	Population.	Births to a Marriage.
1680	5,500,000	4.65
1730	5,800,000	4.25
1770	7,500,000	3.61
1790	8,700,000	3.59
1805	10,678,500	3.50

(10) The argument has next to be considered in reference to France; a country placed under such varying and extraordinary circumstances during the last half century, as to put the principle at issue to the severest possible test. The population, however, has, on the whole, greatly increased during that term, and I shall give the facts bearing upon the question relative to both periods, as calculated by M. Benoiston de Chateauneuf, who, however, has not the least idea of the induction from them, but, on the contrary, is a professed supporter of the theory opposed throughout this treatise. They cannot, therefore, be liable to the suspicion of having been selected with a view to serve the present argument.

TABLE LXXXIV.

SHEWING THAT THE FECUNDITY OF MARRIAGES IN FRANCE HAS DIMINISHED AS ITS POPULATION HAS INCREASED.[1]

Old State, Population in 1780, on 10 Years, 24,800,000.		Proportions to the Population 1 in every	New State, Population in 1825, on 7 Years, 30,400,000.	Proportions to the Population 1 in every
Deaths -	818,490	30.2	763,230	39.9
Births - -	963,200	25.7	957,970	31.7
Marriages	213,770	111.3	224,570	135.3
Illegitimates	20,489	1210.4	657,67	462.2
Prolificness of marriage in 1780, illegitimates excluded - -		4.4	Prolificness in 1825	3.9

Previously to what is called in the above table the old state of France, the Abbé d'Expilly gave a statement of the marriages and births of all France from the years 1754 to 1763 inclusive; and the fecundity of marriages in this more remote term, the population being then smaller, was higher, and amounted to 4.5 children to each[2].

(11) Beyond dispute, therefore, this vast and important country affords an historical as well as present demonstration of the truth of the principle of human increase, as laid down in this Book. It would be in vain to assert, that the great mass of the people in this favoured division of the world have not enlarged their comforts with their enlarging numbers, or to suppose that the government of the Bourbons, since their restoration, has not been as favourable to the country as previous to the revolution. As to the compara-

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[1] Benoiston de Chateauneuf, Bul. Univers., Géog. et Statistique, t. vi., pp. 171, 172.

[2] Barton, Observations, &c., Transactions of the Amer. Phil. Society, vol. iii., p. 29.

tive prevalence of what is called the preventive check, the table speaks for itself; nor can I conceive how the force of the proofs which France yields to the law of population can be denied or evaded.

(12) I would not give undue weight to the proofs derived from short periods of time, but I cannot refrain remarking, that when the registers of the countries of Europe for a few years past are properly examined, there seems to be an uniform tendency to a gradual diminution in the ratio of human fecundity in the whole of them. Such is the case in regard to the last mentioned kingdom, France. The movements of the population there have been published annually since the year 1817, of which, however, I have the accounts only as far as 1825[1]. These confirm the present argument most entirely, as appears by the following table, constructed upon the particulars which will be given in a table inserted in the fifth Book of this treatise, to which I refer the reader in proof that the results are of too uniform a tendency to allow us to suppose that they can arise from what is called chance.

TABLE LXXXV.

SHEWING THAT THE PROLIFICNESS OF MARRIAGES IN FRANCE IS STILL DIMINISHING WITH THE INCREASE OF ITS POPULATION.

Years.	Deaths.	Marriages.	Births.	Conceptions.	Births to 100 Marriages	Conceptions to 100 Marriages
1817 to 1820	3,058,891	842,204	3,555,717	3,566,017	421	423
1821 to 1824	3,031,717	963,063	3,606,257	3,614,979	374	375

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[1] While this sheet was going through the press, I have had an opportunity of extending the enquiry to the years 1826 and 1827; the marriages in which years amounted to 904,594; the births to 1,825,314; and the conceptions (estimated as before) to 1,830,140: the proportion of both to 100 marriages, having therefore declined to 372, still further corroborates the principle in question.

(13) The facts developed in this synopsis of a preceding table, including eight successive years, and divided into two equal periods, which are, therefore, only four years apart, prove that the principle shewn to have influenced the prolificness of marriages in France during the last half century, is still in existence and active operation. As the population increases, that prolificness diminishes; and I must call the reader's attention to the contradiction which is given to the idea that an excess of deaths augments the number of marriages, or that the preventive check is on the increase in that great country. The authorities upon this subject compute the advance of the population at little more than a half per cent.; the mortality actually diminishes, but the marriages during this comparatively short term have advanced above 14 per cent., and are, in the latter section, in the proportion of 1 in 126 on the entire population. I recur to these considerations, which more properly belong to a different part of the argument; but I think the fallacious assertions of the anti-populationists on these points, assertions so confidently and perpetually repeated, cannot be too often confronted with the truth.

(14) Regarding the remainder of the argument, I confess I am less solicitous; I shall, nevertheless, pursue it through the different countries the statistics of which have been appealed to in some of the preceding chapters: and first as to Russia.

(15) Respecting this vast empire, there have been few statistical documents published till of late which are deserving the least attention. The exaggerated statements of the Empress Catherine respecting the prolificness of marriages there, are as worthless as the facts of a contrary nature which Mr. Malthus has got together concerning that country: both are impossibi-

lities to the degree of being completely ridiculous[1]. I am at present aware of only one series of documents by which we can attempt to decide whether the prolificness of Russia diminishes as its population increases. It is that which presents us, during a term of thirty-one years, with the annual increase, or otherwise, of the population of the Greek communion in the whole empire, the number of which is stated to have amounted, according to an actual enumeration, in 1822, to 40,351,000. This increase is calculated by the excess of the births over the deaths in each year[2].

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[1] For instance, Mr. Malthus quotes from Mr. Hermann, that the prolificness of marriages in several of the governments is only three children each; and he has elsewhere supposed that this degree of fertility is very indicative of a considerable increase! One of the districts instanced is Moscow, whereas we know that, in that Government, the number of the births is to that of the marriages, as 5.26 to 1. See Bul. Universel de Géog. et Statis., vol. vii., p. 173.

[2] Balbi, quoted in the Bul. Univers., tom. xii., pp. 106, 107.

Table LXXXVI.

Exhibiting the Increase of the Population of Russia (of the Greek Communion) from the years 1796 to 1827, inclusive.

Years.	Population.	Excess of the Births over the Deaths.	Increase on 1000.
1796	29,177,980	461,521	.2484
7	29,639,501	461,525	
8	30,101,026	428,248	
9	30,529,274	432,418	
1800	30,961,692	440,000	
1	31,401,692	453,205	
2	31,854,897	616,097	
3	32,470,994	475,372	
4	32,946,366	568,469	
5	33,514,835	542,701	
6	34,057,536	500,662	
7	34,558,198	468,508	
8	35,026,706	462,478	
9	35,489,184	466,712	
1810	35,955,896	471,546	
1	36,427,442	369,779	
1812	36,797,221	293,033	.2130
3	37,090,254	(less) 2,740	
4	37,087,514	389,255	
5	37,476,769	407,473	
6	37,884,242	637,247	
7	38,521,489	670,045	
8	39,191,534	556,441	
9	39,747,975	603,025	
1820	40,351,000	662,719	
1	41,013,719	600,591	
2	41,614,310	562,735	
3	42,177,045	663,345	
4	42,840,390	713,285	
5	43,553,675	633,405	
6	44,187,080	450,386	
7	44,637,466		

(16) Such are the proofs the population of Russia affords to the doctrine advanced in this book. The increase in one or two of the first years in the second section of the table was doubtless checked by the war with France; but I conceive this is far more than balanced by the thirteen years of universal peace which ensued, especially if we at all advert to the effects which the more lengthened wars in the first period certainly produced.

(17) But the necessity of all minute rectifications, and all doubts as to the cogency of the argument, are at once removed when we attend to the following facts. First, the expectation of life, as well by the introduction of vaccination as by other means, has undoubtedly improved in Russia as well as in every other civilized country, during the latter half of the period embraced in this table; and part of the increase in that division of it is to be attributed to that cause, proportionably lessening therefore the increase which has taken place from natural prolificness only. Second: the Greek religion, to which the above table solely refers, has most certainly augmented the number of its professors in the Russian empire by other means than procreation; namely, by the numerous accessions to the dominant faith, Christianity, which in that vast extent of country where it is only partially professed, are constantly taking place; and above all, by those acquisitions amounting to many thousands of square miles, and containing millions of Greek Christians which have been added to the empire during the same period. On the whole, then, notwithstanding the greater accumulation of population from an equal number of births, which takes place in consequence of the elongation of human life, and the large accessions to the numbers of the Greek

church by other means than that of procreation, the increase of the population relatively to its numbers has actually declined; proving, therefore, that the prolificness of marriages during the same term has diminished in a still more extraordinary degree. The statistics of Russia, therefore, abundantly demonstrate the principle at issue.

(18) In Denmark the prolificness of marriages from the year 1769 to 1774 averaged, as before mentioned, 4.89 children each[1]. In twenty years afterward, the population having considerably augmented, that proportion was reduced to 4.04 to one. In Prussia, from the year 1756 to 1784, the same proportion was 4.7 to one[2]: in the year 1817, the population, meantime, having at least trebled, we find it reduced to 4.05 to one[3].

(19) In Sweden, the fecundity of marriages in 1748, the population being then 1,736,483 only, was 4.3 children to each[4]; in 1823, the population amounting to 2,687,457, that fecundity had fallen to 4.09.[5] That the prolificness of marriages has diminished in Sweden, Mr. Malthus acknowledges, accounting for it, however, conformably to his system, and therefore erroneously. The marriages are neither fewer in proportion to the population, nor contracted at a later period in life, but the reverse is the truth in both cases.

(20) Since writing the preceding paragraph, an extract from the report of the royal commission of statistics, regarding the births, &c. of this kingdom, from 1821 to 1825, has met my eye. This brings down the information to a later date, and the facts it presents in relation to the present subject are as follows[6].

Sussmilch, Gött. Ord., th. iii., p. 64. Tab.

[2] Ibid., th. iii., p. 63. Tab.

[3] Jacob, Travels, p. 233.

[4] Wargentin, Ency. Brit. Supp., vol. vi., p. 396.

[5] Bul. Univers., Géog. et Statist., t. iv., p. 302.

[6] Kongl. Tabell. commiss., &c. Bul. Univers., vol. xiii., p. 499.

TABLE LXXXVII.

SHEWING THE PROLIFICNESS OF MARRIAGES IN SWEDEN DURING FIVE YEARS, FROM 1821 TO 1825 INCLUSIVE.

Years.	Marriages.	Births.	Deaths.	Population.	Proportion of Births to each Marriage.
1821	22,890	92,072	66,416	2,584,690	
1822	24,431	94,309	59,390		
1823	23,993	98,259	56,067		
1824	23,907	93,577	56,256		
1825	23,640	100,315	56,465	2,771,252	
Mean Numbers.	23,772	95,706	58,919	2,677,971	4.02

(21) The kingdom of the Netherlands, which has been already noticed as fulfilling the rule of human increase by means the most varied, still conforms to the general argument in this respect also, as the following short table, exhibiting the increase of four consecutive years, will fully shew[1].

TABLE LXXXVIII.

SHEWING THE DIMINISHING RATIO OF INCREASE IN THE KINGDOM OF THE NETHERLANDS AS POPULATION HAS INCREASED, FROM THE YEARS 1824 TO 1827 INCLUSIVE.

Years.	Population of the Pays-Bas.	Increase.[1]	Ann. Increase per cent.
1824	5,913,526		
1825	5,992,666	79,140	0.0134
1826	6,059,638	66,972	0.0112
1827	6,116,935	57,297	0.0094

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[1] Quetelet, Recherches sur la Pop., &c., des Pays-bas, p. 5.

CHAPTER XVI.

OF THE LAW OF POPULATION; AS PROVED BY THE EFFECTS OF THE INCREASE OF INHABITANTS UPON HUMAN PROLIFICNESS IN IRELAND AND IN THE UNITED STATES.

(1) It has been already remarked that the statistics of Ireland and of the United States of America, two countries concerning which more has been said of late, in reference to population, than of all the nations in the world besides, present us with no accounts of annual marriages and births. In the former part of the argument, however, a proof of the principle of population has been constructed, from the materials which their respective censuses present, as discriminated into ages; of infinitely more importance than had it been founded upon the facts appealed to respecting the other countries examined: arriving, as it did, at the same conclusion by means totally different, and not liable to those objections which may, possibly, though unfairly, be urged against the former method. I proceed, therefore, to apply the same principle of computation to the further consideration of the population of these two countries, in reference to the historical part of the present demonstration; and first, as it regards Ireland.

(2) Ireland is a country where the population has probably varied more than in most others, and must, therefore, furnish a proof of the principle, if it is true, of a most minute and interesting and decisive nature; supposing us to be in possession of the necessary data. During the course of this inquiry, I have met with

such, and have applied them to the argument, with what success the following results will determine.

(3) Dr. Anderson has transcribed, in his History of Commerce[1], a printed list of the families in each of the four provinces of Ireland, about the year 1733; which, according to the mode of enumeration then adopted, and corroborated by the statement of Dr. Maule, the Bishop of Dromore, amounted to the following number of persons in each. In Leinster, 653,020; in Munster, 614,654; in Ulster, 505,395; and in Connaught, 242,160; which give, in the first province, 150 on the square mile; in the second, 116; in the third, 104; in the last, 59. According to the principle of population for which I contend, the prolificness would be the greatest, where the numbers on an equal space were the fewest; and consequently the increase, in such cases, the largest. Now, it must be remarked, that the order in which these provinces then ranked, in reference to the density of the population, was almost directly the reverse of that in which they stand at present. If, therefore, through the intervening period of nearly ninety years, the increase has conformed to the law of population laid down, it will certainly amount to an additional proof of its reality and truth, of a singularly satisfactory character; as shewing that that law acts upon a principle totally distinct from any temporary or local peculiarities whatsoever: and such turns out to be the fact. The following table, in which the provinces are arranged according to the comparative density of the population at the former period, exhibits these conclusive results.

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[1] Anderson, History of Commerce, vol. ii., p. 348.

TABLE LXXXIX.

DEMONSTRATING THE LAW OF POPULATION FROM ITS INCREASE IN THE PROVINCES OF IRELAND, FROM THE YEAR 1733 TO 1821.

Provinces.	Population in 1733.	Square Miles.	Population to a square Mile in 1733.	Population in 1821.	Increase on every 100.
Leinster . .	653,020	4356	150	1,757,402	169
Munster . .	614,654	5275	116	1,935,612	215
Ulster . .	505,395	4894	104	1,998,494	295
Connaught .	242,160	4108	59	1,110,229	358

(4) No comments on the foregoing table are necessary. In Leinster, where there were at the former date, one hundred and fifty on the square mile, the increase, during the period under examination, was one hundred and sixty-nine on every hundred: whereas, in Connaught, where there were only fifty-nine, the increase was more than double on that proportion; and amounted to three hundred and fifty-eight. The remaining provinces, it need not be pointed out, confirm the principle most exactly, and class themselves accordingly.

(5) Mr. Ricardo lays it down as an axiom, in full conformity with Mr. Malthus's views on the same subject, that "population regulates itself by the "funds which are to employ it, and therefore always "increases or diminishes with the increase or dimi-"nution of capital[1];" a position which may be pronounced to be as false in theory, physiologically considered, as it is in fact; in a word, as opposite to the plain truth in every point of view, as any thing that

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[1] Ricardo, Principles of Political Econ., p. 638, 3d Ed.

political economy, which is perpetually repeating it, has yet uttered. From the summit of Irish society, the peerage, to its lowest grade, the poor cottager of Connaught, the very reverse of this confident assertion is the precise truth. These remarks, however, are superfluous: few, I think, will now be found to contend, that it has been to the superior plenty and prosperity of Connaught, compared with Leinster, that the vastly greater increase of the former is to be attributed; the reverse is an universally known fact.

(6) Should it be remarked that the period in question is so extended, as to have gradually changed the relative density of the population of these provinces, and that the demonstration is so far confused and unsatisfactory; to obviate this remaining objection, (and I confess it has some weight, till examined,) I will appeal to the increase of the different provinces during about a third of that time, namely, a period of exactly thirty years; especially, as at its commencement, the change alluded to had already taken place. Taking then the last enumeration of Thomas Wray, Esq., inspector-general of the hearth-money, the following table will exhibit the movements of the population in the several provinces; and again illustrate and prove, with singular exactness, the principle of human increase for which I am contending. I have again classed the provinces, according to their relative density of population, that having, at the period referred to, become greatly changed.

TABLE XC.

DEMONSTRATING THE LAW OF POPULATION, FROM THE INCREASE IN THE PROVINCES OF IRELAND, BETWEEN THE YEARS 1791 AND 1821.

Provinces.	Population, 1791.	Inhabitants on a square Mile, 1791.	Population, 1821.	Increase on every 100.
Ulster . .	1,337,274	273	1,998,494	40
Leinster . .	1,111,512	255	1,757,492	58
Munster . .	1,161,138	220	1,935,612	66
Connaught .	596,688	145	1,110,229	86

(7) That the first of these columns of population, that of 1791, errs in deficiency, I think there can be little doubt. But as the causes of such incorrectness, and more especially the motives which in many cases occasioned it, whatever they were, must have been alike operative in every part of the country, the deductions, as far as the present argument is concerned, are equally conclusive. They prove that, on the very same ground, the measure of human increase, individually considered, is constantly regulated by the existing numbers, and varies with every variation of the latter. Equally certain is it, that in each of the periods alluded to, superiority in condition has still been identified with greater numbers on an equal space.

(8) It may, perhaps, be expected that some notice should be taken of the incomplete census of 1813; about one-third, however, of the thirty-two counties which Ireland comprises, are returned in that document as deficient; and it is, therefore, more than probable, that the rest were very imperfectly enumerated.

Still, as it may be presumed the errors were proportionate where the measure was apparently successful, we will lastly try whether the facts it presents are conformable, or otherwise, to the principle laid down, and I trust already fully proved.

TABLE XCI.

DEMONSTRATING THE LAW OF POPULATION FROM THE INCREASE IN THE PROVINCES OF IRELAND, BETWEEN THE YEARS 1813 AND 1821[1].

Provinces.	Inhabitants on a square Mile, 1821.	Population, 1813.	Population, 1821.	Increase per cent.
Ulster . .	251	1,207,448	1,349,698	11
Leinster . .	216	837,951	979,616	16
Munster . .	204	1,273,149	1,528,798	20
Connaught .	162	489,576	626,626	28
		3,808,124	4,484,738	17

(9) To shew, once more, that local habits or customs are not the causes which govern the operations of this law of increase, the following table, relative to Ireland, is lastly subjoined; in which the counties are classed, not under their respective provinces, but according to the number of statute acres which, in 1813, there appeared to be in each, to every individual inhabitant.

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[1] Irish Census, 1821.

TABLE XCII.[1]

DEMONSTRATING THE LAW OF POPULATION, FROM THE INCREASE OF THE INHABITANTS OF THE COUNTIES ENUMERATED IN 1813, BETWEEN THAT YEAR AND 1821.

Counties.	Provinces.	Acres to each inhabitant.	Population, 1813.	Population, 1821.	Increase per cent.
Down . .	Ulster .	2.	287,290	325,410	
Monaghan .	Do.	2.1	140,433	174,697	
Longford .	Leinster .	2.3	95,917	107,570	
Londonderry	Ulster .	2.8	186,181	193,869	
Antrim . .	Do.	2.9	231,548	262,863	
			941,369	1,064,409	13
Tyrone .	Do.	3.	250,746	261,865	
Tipperary .	Munster .	3.1	290,531	346,896	
Carlow . .	Leinster .	3.2	69,566	78,952	
Cork . .	Munster .	3.2	523,936	629,786	
Queen's Co. .	Leinster .	3.2	113,857	134,275	
Waterford .	Munster .	3.3	119,457	127,842	
Roscommon .	Connaught	3.5	158,110	208,729	
Kilkenny .	Leinster .	3.6	134,664	158,716	
Meath . .	Do.	3.7	142,479	159,183	
			1,803,346	2,106,244	16
King's Co. .	Leinster .	4.	113,226	131,088	
Fermanagh .	Ulster .	4.1	111,250	130,997	
Leitrim . .	Connaught	4.4	94,095	124,785	
Kildare . .	Leinster .	4.5	85,133	99,065	
Clare . .	Munster .	4.8	160,603	208,089	
			564,307	694,024	22
Mayo . .	Connaught	5.4	237,371	293,112	
Kerry . .	Munster .	5.8	178,622	216,185	
Wicklow .	Leinster .	6.	83,109	110,767	
			499,102	620,064	24

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[1] Irish Census, 1821.

(10) But I shall conclude this part of the argument by again appealing to a quarter of the world whence the anti-populationists profess to have derived their principal, if not only, proofs; how erroneously has been already partly shewn, and will now be fully exposed: I mean America. I might here, like themselves, produce mere assertions, and argue from thence, that the prolificness of American marriages has declined as its population has advanced; a species of evidence in this case, I think, not altogether unworthy of credit. The early colonists were, if we may believe contemporary and unanimous authority, amazingly prolific. Sir William Petty says, that in New England, there were few or no women barren, and that most had many children[1]. The benevolent William Penn asserts "that almost every house was full of children, it being," he observes, "rare to find one of them without three "or four boys, and as many girls; some six, seven, "and eight sons[2]." To come later down, Dr. Franklin, in his celebrated essay, which he wrote about three parts of a century ago, tells us, that the females in that quarter of the world, had, "one with another, eight children to a marriage[3]." Allowing there is any truth in these and similar assertions, which might be multiplied at pleasure, when we come to compare them with the facts which more recent information has presented to us, such as those communicated by Dr. Barton[4], Dr. Holyoke[5], and others; we must arrive at the same conclusion with regard to America to which we have already arrived respecting the countries of Europe, namely, that the fecundity of marriages has diminished as population has augmented.

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[1] Sir William Petty, Polit. Arith., p. 271.

[2] William Penn's Works, vol. ii., p. 705.

[3] Franklin's Works.

[4] Barton, Obs. on American Phil. Transact., vol. iii., p. 30.

[5] Holyoke quoted by Brissot, Travels in the United States, pp. 362, 363, 364.

(11) But, happily for this concluding proof of the principle contended for, it does not rest upon mere assertions, however respectable. We may again appeal to the censuses of America upon this important point; and with an effect as decisive as before. The reader, however, is again reminded, that, as the process is utterly different from that pursued regarding the other countries, the conclusion, which is still identical throughout, is the more striking: it is, indeed, incontrovertible.

(12) The ensuing table exhibits all the States of North America which were in existence at the taking of the census of 1800, classed as before; and traces the prolificness of each class by the method previously adopted, (and a more certain one cannot be conceived,) from that year to the two remaining censuses of 1810 and 1820. It is most remarkable, that in only one section in the table, and that section consisting of a single state, and affecting that state but in one period, is there the least aberration apparent; an exception too trivial to be noticed, but that, curious enough, even this seems on examination to originate, in all probability, in some miscalculation in the census. It would be otherwise most strange if a maritime part of North America, where, were there no other employments but agriculture, there are still a hundred acres of land to each family, should have increased in twenty years only about eight thousand souls, and in ten of them seventy-five individuals only! Whatever be the fact, however, it is as dust in the balance compared with the overwhelming weight of the ensuing demonstration.

TABLE XCIII.[1]

DEMONSTRATING THE LAW OF POPULATION FROM THE INCREASE IN THE DIFFERENT STATES OF NORTH AMERICA, DURING THE INTERVALS OF THE THREE LAST CENSUSES.

States.	Population to a square Mile, in 1800.	Females from 16 to 45, in 1800.	Children under 10, in 1800.	Children to 100 Females, in 1800.
Indiana . . .	.1	.817	1.645	
Mississippi . .	.2	.778	1.952	
Ohio . . .	1.1	7.203	18.006	
Tennessee . .	2.6	15.546	37.686	
Georgia . .	2.6	18.078	37.888	
Maine . . .	4.7	27.791	54.869	
Under 5 *on the square mile.*	2.8	70.213	152.046	218
Kentucky . .	5.6	30.458	72.223	
North Carolina	9.9	63.654	122.292	
From 5 *to* 10.	7.8	94.112	194.515	206
New York . .	10.5	104.536	195.570	
Virginia . .	12.6	92.955	181.320	
Pennsylvania .	12.8	107.820	202.850	
South Carolina	14.4	35.381	72.075	
From 10 *to* 15.	12.6	340.692	651.815	191
Vermont . .	15.1	27.893	57.692	
New Hampshire	19.4	35.534	60.565	
From 15 *to* 20.	17.8	63.427	118.257	186
Maryland . .	25.2	45.333	72.597	
New Jersey .	25.4	36.551	66.522	
From 20 *to* 30.	25.3	81.884	139.119	169
Delaware . .	30.3	10.524	15.878	
From 30 *to* 40.	30.3	10.524	15.878	150
Rhode Island .	43.7	13.382	19.469	
From 40 *to* 50.	43.7	13.382	19.469	146
Connecticut . .	53.7	48.747	73.682	
From 50 *to* 60.	53.7	48.747	73.682	151
Massachusetts .	67.6	84.234	124.566	
From 60 *to* 70.	67.6	84.234	124.566	147

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[1] National Calendars.

TABLE XCIII.—(*continued.*)

States.	Population to a square Mile, in 1810.	Females from 16 to 45, in 1810.	Children under 10, in 1810.	Children to 100 Females, in 1810.
Indiana . . .	2.	4.108	9.478	
Mississippi . .	1.	3.940	8.232	
Ohio	5.7	39.426	90.815	
Tennessee . .	6.5	37.488	86.304	
Georgia . . .	4.	25.831	54.285	
Maine . . .	7.	42.755	80.404	
	4.4	153.548	329.518	214
Kentucky . .	10.4	55.431	125.910	
North Carolina .	10.5	71.877	133.457	
	10.5	127.308	259.367	203
New York . .	20.8	170.944	323.878	
Virginia . .	13.9	106.062	188.492	
Pennsylvania .	17.3	146.786	270.223	
South Carolina .	47.2	39.557	77.156	
	17.3	463.349	859.749	185
Vermont . .	21.2	41.775	74.703	
New Hampshire	20.6	42.732	66.597	
	20.9	84.507	141.300	167
Maryland . .	27.1	46.783	74.750	
New Jersey . .	29.5	42.553	73.866	
	28.3	89.336	148.616	166
Delaware . .	34.2	11.068	18.673	
	34.2	11.068	18.673	169
Rhode Island .	48.6	15.155	21.290	
	48.6	15.155	21.290	140
Connecticut . .	56.	51.266	73.725	
	56.	51.266	73.725	143
Massachusetts .	78.	95.595	135.811	
	78.	95.595	135.811	142

TABLE XCIII.—(*continued.*)

States.	Population to a square Mile, in 1820.	Females from 16 to 45, in 1820.	Children under 10, in 1820.	Children under 10 to 100 Females, in 1820.
Indiana . . .	4.3	25.644	57.313	
Mississippi . .	1.6	6.898	15.324	
Ohio . . .	14.5	102.134	217.719	
Tennessee . .	10.5	59.500	131.165	
Georgia . . .	8.4	34.007	68.621	
Maine . . .	9.	59.071	95.782	
	8.	287.254	585.924	204
Kentucky . .	14.4	77.388	160.691	
North Carolina .	13.2	80.322	146.446	
	13.8	157.710	307.137	194
New York . .	29.7	262.391	439.121	
Virginia . . .	15.2	118.406	202.448	
Pennsylvania .	22.4	194.749	342.091	
South Carolina .	20.8	44.601	82.549	
	22.	620.147	1066.209	172
Vermont . .	23.	48.396	71.035	
New Hampshire	25.7	50.603	70.065	
	24.4	98.999	141.100	143
Maryland . .	29.1	53.640	80.965	
New Jersey . .	33.3	50.330	81.976	
	31.2	103.970	162.941	156
Delaware . .	34.3	11.110	17.728	
	34.3	11.110	17.728	159
Rhode Island .	52.5	17.078	22.447	
	52.5	17.078	22.447	131
Connecticut . .	58.6	56.274	72.137	
	58.6	56.274	72.137	128
Massachusetts .	83.7	110.526	133.253	
	83.7	110.526	133.253	120

TABLE XCIII.—(*continued.*)

States.	Population to a square Mile, in 1810.	Females from 16 to 45, in 1810.	Children under 10, in 1810.	Children to 100 Females, in 1810.
Indiana . . .	2.	4.108	9.478	
Mississippi . .	1.	3.940	8.232	
Ohio . . .	5.7	39.426	90.815	
Tennessee . .	6.5	37.488	86.304	
Georgia . . .	4.	25.831	54.285	
Maine . . .	7.	42.755	80.404	
	4.4	153.548	329.518	214
Kentucky . .	10.4	55.431	125.910	
North Carolina .	10.5	71.877	133.457	
	10.5	127.308	259.367	203
New York . .	20.8	170.944	323.878	
Virginia . .	13.9	106.062	188.492	
Pennsylvania .	17.3	146.786	270.223	
South Carolina .	47.2	39.557	77.156	
	17.3	463.349	859.749	185
Vermont . .	21.2	41.775	74.703	
New Hampshire	20.6	42.732	66.597	
	20.9	84.507	141.300	167
Maryland . .	27.1	46.783	74.750	
New Jersey . .	29.5	42.553	73.866	
	28.3	89.336	148.616	166
Delaware . .	34.2	11.068	18.673	
	34.2	11.068	18.673	169
Rhode Island .	48.6	15.155	21.290	
	48.6	15.155	21.290	140
Connecticut . .	56.	51.266	73.725	
	56.	51.266	73.725	143
Massachusetts .	78.	95.595	135.811	
	78.	95.595	135.811	142

TABLE XCIII.—(*continued.*)

States.	Population to a square Mile, in 1820.	Females from 16 to 45, in 1820.	Children under 10, in 1820.	Children under 10 to 100 Females, in 1820.
Indiana . . .	4.3	25.644	57.313	
Mississippi . .	1.6	6.898	15.324	
Ohio . . .	14.5	102.134	217.719	
Tennessee . .	10.5	59.500	131.165	
Georgia . . .	8.4	34.007	68.621	
Maine . . .	9.	59.071	95.782	
	8.	287.254	585.924	204
Kentucky . .	14.4	77.388	160.691	
North Carolina .	13.2	80.322	146.446	
	13.8	157.710	307.137	194
New York . .	29.7	262.391	439.121	
Virginia . . .	15.2	118.406	202.448	
Pennsylvania .	22.4	194.749	342.091	
South Carolina .	20.8	44.601	82.549	
	22.	620.147	1066.209	172
Vermont . .	23.	48.396	71.035	
New Hampshire	25.7	50.603	70.065	
	24.4	98.999	141.100	143
Maryland . .	29.1	53.640	80.965	
New Jersey . .	33.3	50.330	81.976	
	31.2	103.970	162.941	156
Delaware . .	34.3	11.110	17.728	
	34.3	11.110	17.728	159
Rhode Island .	52.5	17.078	22.447	
	52.5	17.078	22.447	131
Connecticut . .	58.6	56.274	72.137	
	58.6	56.274	72.137	128
Massachusetts .	83.7	110.526	133.253	
	83.7	110.526	133.253	120

Synopsis of the foregoing Table.

Periods of enumeration.	6 States.		2 States.		4 States.		2 States.		2 States.		1 State.		1 State.		1 State.		1 State.	
	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.	Inhabitants on a square Mile.	Children under 10 to every 100 Females, 16 to 45.
1800	2.8	218	7.8	206	12.8	191	17.8	186	25.3	169	30.3	150	43.7	146	53.7	151	67.6	147
1810	4.4	214	10.5	203	17.3	185	20.9	167	28.3	166	34.2	169	48.6	140	56.	143	78.	142
1820	8.	204	13.8	194	22.	172	24.4	143	31.2	156	34.3	159	52.2	131	58.6	128	83.7	120
Averages	5.1	212	10.7	201	17.3	183	21.	165	28.3	163	32.9	159	48.2	139	56.1	140	73.1	136

(13) The results thus presented to the reader, are too striking and decisive to need any remark, or, indeed, to admit of any contradiction. In one line of a single column only, and that consisting but of one State (in the enumeration of which, as before observed, there must certainly be some mistake), is there the slightest deviation from the principle in question, as deduced from the whole body of facts contained in three successive censuses, thus minutely divided. To dwell, therefore, on the proofs derived from the statistics of America, on the law of population, as unfolded in these pages, is unnecessary; to withstand them, it is conceived, is impossible.

CHAPTER XVII.

OF THE LAW OF POPULATION, AS PROVED BY THE EFFECTS UPON HUMAN PROLIFICNESS OF AN INCREASE OF THE INHABITANTS OF TOWNS.

(1) HAVING shewn, in a preceding chapter, that human prolificness is so strictly regulated, as not only to vary with the number of the inhabitants in an equal space, in countries and districts, but in proportion to the size and population of towns also, I proceed, in conformity with the method hitherto pursued, to prove that, in the latter, the fecundity of marriages has likewise diminished as the population has augmented. I feel persuaded, after the evidence already advanced, that this part of the argument will be deemed superfluous: it shall therefore be treated with much brevity.

(2) It cannot be denied, that as many of the towns of England have, within comparatively short periods, risen from the condition of what would now be deemed villages to their present size; so, in conformity with the principle contended for, the prolificness of marriages, in such places, ought to exhibit a marked diminution.

(3) I shall exemplify and substantiate this fact by referring to recorded documents, decisive of this subject, regarding six only of the towns of England; taking the largest in rotation, again to avoid, as I have hitherto done, the errors, or at least suspicions, which always attend an arbitrary selection of proofs, I shall calculate the prolificness of these by the usual method,

that of dividing the sum of the births, of a given number of years, by the sum of the marriages of the corresponding ones, as I am convinced, after no little consideration of the subject, that it is a more safe mode, on the whole, than the one now sometimes adopted; and preferable, more especially, because it enables us to institute those comparisons, with regard to former results of the same nature, that were similarly calculated, which could not otherwise be done. I may, however, be permitted to state, that I had formed the following, and, indeed, most of the preceding computations, in the other method also; and, I hardly need add, with precisely the same comparative results, on which, it is superfluous to repeat, the whole argument is necessarily founded.

(4) In the following instances I shall take four periods: the first, anterior to the date of the published registers of marriages and births in this country; the second, commencing with those accounts, namely, with the year 1755, the first year in which the Marriage Act came into full operation, calculating the prolificness of the marriages in that year on the average of the births of 1750 and 1760; the third, from the year 1790 to 1800; terminating with the last decenniary given in the census of 1821. In both the latter cases, the prolificness is computed on the amount of the births and marriages during each term. I may again repeat, that I am not responsible for the absolute correctness of these accounts; nor is the argument the least affected by a contrary supposition, it is their comparative accuracy on which it rests: and we are assured they have been progressively improving, at least during the last period; former deficiencies will, therefore, evidently strengthen the conclusion at which I am about to arrive.

(5) To commence with the metropolis. It has been already seen, that the fertility of marriages there, at about the termination of the seventeenth century, was calculated at 4 children each[1]. In 1755, computed as before explained, it had fallen to 3.52[2]; the concluding ten years of the last century, to 2.36[3]; and from 1810 to 1820, notwithstanding the improvement in the registers, to 2.35[4].

(6) Concerning Manchester, I find in Dr. Short's collections, that from 1731 to 1752, the population of the town being under 9000, the fecundity of marriages was 4.37 children each[5]; in 1755, it was 2.44 only[6]; in 1790—1800[7], (the population at the latter date having increased to 84,000,) it had fallen to 2; and in the last term, the inhabitants having increased to above half as many again, it sunk as low as 1.72[8].

(7) Liverpool affords a yet more striking example of the operation of the principle in question. Less than three centuries ago it had not the number of inhabitants now found in many inconsiderable villages[9]. It has, since that period, gone through almost every stage of population; in its first state it was a "small fishing place," and consequently, agreeably to the observations made elsewhere, ought to exhibit a high degree of prolificness; and such is the fact. The registers, as given by Dr. Enfield, from 1662 to 1700, as well as those inserted in Sir F. M. Eden's Parochial Reports, relating to about the same period, give so large a degree of fruitfulness, as to render their inaccuracy quite obvious. The births and marriages

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[1] Gregory King, Polit. Conclusions. Chalmers' Estimate, p. 420.

[2] Abstract, Parish Registers, 1801, p. 448.

[3] Ibid., Appendix, p. 448.

[4] Ibid., 1821, p. 158.

[5] Short, Comparative History, p. 39.

[6] Abstract, Parish Registers, p. 149.

[7] Ibid., p. 149.

[8] Ibid., 1821, p. 60.

[9] In Nov. 1565, there were in Liverpool only 138 householders and Cottagers.—Enfield's Liverpool, p. 11.

of the two last periods of the seventeenth century, as given by Dr. Aikin, make the former to the latter 5.7 to 1[1], which proportion, though the lowest I have seen, errs in excess; or may, perhaps, arise from a large influx of persons into the town at that period, already married, but having children subsequently born there. In 1700, Dr. Aikin estimates the inhabitants as amounting to 4240 persons[2]; the proportion of births to marriages, from that date to 1710, inclusive, according to Dr. Enfield, is 4.05 to 1[3]. The registers, as published by Sir F. M. Eden, give the proportion of births somewhat greater[4]. In the year 1755 the population had advanced to above 25,000[5]; the same proportion consequently declined to 3.53 to 1[6]. In 1800, the population had again surprisingly advanced, and was as great as 77.653[7]; the fertility of marriages for the preceding ten years had therefore dropped to 2.55[8]. In 1820, the inhabitants were 118,972[9]; the same proportion, in this one instance, advanced to 2.97[10]; but this deviation is fully accounted for by the general peace, which occurred during the last term; which, as already remarked, has a sensible influence on the prolificness of marriages, and more especially in a great seaport, where it has the effect of reuniting so large a number of couples, generally in the prime of life. To which reason, perhaps, ought to be added, the superior exactness with which the Rector of that town appears to have furnished the necessary information[11].

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[1] Aikin, Manchester and Environs, p. 335.

[2] Ibid., p. 335.

[3] Enfield's Hist. of Liverpool, p. 25.

[4] Eden, State of the Poor, vol. ii., p. 337.

[5] Aikin, Environs of Manchester, p. 341.

[6] Abstract, Parish Registers, 1801, p. 149.

[7] Abstract, Population, 1801, p. 173.

[8] Abstract, Parish Registers, 1801, p. 173.

[9] Abstract, Population, 1821, p. 160.

[10] Abstract Parish Registers, 1821, p. 60.

[11] Rev. R. H. Roughedge, Pop. Abstract, 1821, p. 60.

(8) The next town in point of magnitude is Birmingham. Less than two centuries ago this place also was not so populous as many of our present villages. At the commencement of the seventeenth century, we are informed by Dr. Short, that the annual births were, to the marriages, as 6½ to 1[1]. In 1755, according to the official accounts, the proportion was 4.74 to 1[2]. In 1790—1800, it had fallen to 3.36 to 1[3], the population having risen to 73,670[4]; and in the last period recorded in the published abstracts, the inhabitants having further augmented to above one hundred thousand, it declined to 2.43 to 1[5].

(9) Regarding Bristol, I have at present no other information bearing on the subject than that communicated by the public reports. According to these, in 1755, the proportion of marriages to births was as 1 to 2.86[6]; in ten years prior to 1801, the population having increased to 63,645 [7], the same proportion was as 2.42 to 1 [8], and in the last period, the inhabitants having increased to 87,779[9], it fell to 1.95 to 1 [10]. I have already stated the reason why, in this town and Manchester, the prolificness of marriages appears on the registers too low; nor need I again repeat, that that fact has not the least bearing on the present argument.

(10) Leeds is the last town to which I shall now advert. In the first period recorded by Dr. Short, ending early in the eighteenth century, the births were to the marriages as 3.73 to 1[11]; in the second, including sixteen years, and ending 1746, as 3.38[12].

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[1] Short, Comparative History, p. 41.

[2] Abstract, Parish Registers, 1801, p. 319.

[3] Ibid., p. 319.

[4] Abstract, Population, 1801, p. 375.

[5] Abstract, Parish Registers, 1821, p. 125.

[6] Ibid., p. 113.

[7] Abstract, Population, 1821, p. 126.

[8] Abstract, Parish Registers, 1801, p. 113.

[9] Abstract, Population, 1821, p. 117.

[10] Abstract, Parish Registers, 1821, p. 46.

[11] Short, Comparative History, p. 41.

[12] Ibid., p. 41.

In 1756, the proportion, calculated on the published registers, would be 3.03[1] only, but doubtless inaccurate, in consequence of what I take to be a palpable mistake in giving the marriages of that year as more numerous than any of the succeeding ones for many years afterwards. In 1801 the population was 53,162[2]; the same proportion was, during the ten preceding years, as 3.30 to 1[3]. In 1821, the population was 83,796[4]; and that proportion, calculated as before on the last decenniary, had become 3.07 to 1[5].

(11) I had carried these computations much further and with, at least, equal success; I shall not, however, needlessly multiply instances. It must already appear abundantly plain, that the prolificness of marriages diminishes in towns, as well as in districts or entire countries, as the population augments and condensates.

(12) It will hardly be contended, I think, that this diminution in the prolificness of marriages in the towns of this country, the population of which is increasing, is confined to England, and attributable to some national peculiarity. As, however, there are few subterfuges to which the theory opposed does not stoop, in attempting either to urge or refute those arguments with which it has to deal, I shall lastly shew the principle elsewhere, in known and acknowledged operation, though its cause has been totally overlooked or misunderstood. And the instance shall not be taken from the records of some obscure and unimportant place, or from some short and selected period of time, but from the movements of the population of the city of Paris, as accurately observed for a century and a half

[1] Abstract, Parish Registers, 1801, p. 371.

[2] Abstract, Population, 1801, p. 450.

[3] Abstract, Parish Registers, 1801, p. 371.

[4] Abstract, Population, 1821, p. 425.

[5] Abstract, Parish Registers, 1821, p. 144.

past. The authority I quote is that of a document communicated by the Comte de Chabrol to a committee of the House of Commons, and published by their authority.

(13) "The total number of births in the city of "Paris," says this important paper, "from 1670 to "1821, is 2,450,671 $\frac{1}{3}$[1]; and the total number of marriages, within that period, is 584,792. The quotient "is very nearly 4 and $\frac{1}{5}$.

"In the last thirty years of the seventeenth century, *i. e.* from 1670 to 1700, the proportion of the "number of births to the number of marriages was "about 4 and $\frac{4}{5}$ths; to every 5 marriages there were "24 births. This number has constantly diminished. "It was 4$\frac{2}{5}$ths from 1710 to 1750; 4$\frac{1}{10}$th from 1750 "to the beginning of 1790; and from that period it "has been 3$\frac{9}{10}$ths.

"Since the year 1700, the relative number of births "has diminished about $\frac{1}{8}$th; so that at the present "day, the birth of a child supposes 33 or 34 inhabitants, whereas, a century past, we calculated one "new-born child to every 30 or 29 inhabitants.

"The relative number of deaths has diminished as "the relative number of births[2]."

(14) M. Benoiston de Chateauneuf has shewn that, during the last three years, illegitimate births formed one-third of those which took place within that period. The proportion of births from marriages was as 2$\frac{6}{10}$; a very trifling fecundity, (as he justly observes,) for a city in which the generality of people imagine life to be so happy and so easy[3].

(15) To the facts this important document discloses must be added this further consideration: the illegiti-

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[1] Including illegitimate children.

[2] Report on Friendly Societies, App., p. 166, 167.

[3] Ibid.

mate births during this entire period have been greatly and progressively on the increase in France. They have above trebled in number in less than half a century; an increase from which it would be idle to suppose the capital exempt. Were these regularly deducted from the legitimate births, the result would shew a far greater diminution in the fecundity of marriages than that exhibited in the above report.

(16) It is thus that every document to which we turn, containing the necessary information, proves that the prolificness of mankind is regulated by the amount of the great masses in which they associate, as well as by the proportionate density in which they people any entire district or country of the world.

CHAPTER XVIII.

OF THE LAW OF POPULATION: OBJECTION GROUNDED ON WHAT IS CALLED "THE PREVENTIVE CHECK," AS APPLIED TO THE FOREGOING DEMONSTRATIONS, STATED AND REFUTED.

(1) BEFORE proceeding to the consideration of the remaining branches of the argument, I shall here pause to examine the main, and, as I conceive, the only objection that can be urged against the demonstration which the preceding parts of it have given to the law of population. This objection is founded on the operation of what is called the preventive check, which is at once the one argument for the theory of the anti-populationists, and their sole defence against that of all others.

(2) This objection, however, when duly examined, will, like all others urged against the system of nature, be found to resolve itself into an additional confirmation of its truth. Those who have written most upon the subject of the "preventive check" have totally mistaken the principle upon which alone its comparative prevalence can be computed; they have been deceived as to its effects, physiologically considered; and they have erred as widely respecting the situation and circumstances in which they suppose it to operate most powerfully, and their assertions have in this respect completely reversed facts. Their mistakes in the two former cases have been already sufficiently exposed; it only remains that their mis-statements regarding the last should be as fully confuted.

(3) That the marriages in a community are proportionably numerous as there is, literally speaking, room made for them, by deaths or otherwise, and that the preventive check is, therefore, more effectually operative in towns than in country places, and in the latter, therefore, as their population condensates, is an idea which is perpetually dwelt upon by the superpopulationists. Were it true, it would, questionless, considerably weaken the force of the preceding proofs in favour of a better system. As an objection, therefore, it is well worthy of attentive and distinct consideration; and it will repay it, not only by firmly establishing the validity of the proofs already advanced, but by greatly increasing their weight, and rendering the demonstration still more striking and decisive.

(4) The assertion of our anti-populationists, that the preventive check prevails more generally in towns than in country places, is one of those reckless misrepresentations of which those who have to deal with their arguments justly complain. The very contrary would have been clear to them, had they taken the pains to make the least attempt at calculation; and, if averse to that trouble, the result was already pointed out, and in so many words, by the authorities they themselves quote. Thus Dr. Short says, "that "the earlier marriages in towns than in the country "is evident by comparing country and town registers[1];" and still this indefatigable writer observes elsewhere that great cities and towns are the least prolific[2]. In proof of both these observations, we only need turn to the tables already given in the fourteenth Chapter of this Book, by which it appears that whereas in the towns of England the prolificness of marriages is on the average only 2.61 baptisms to each, still the

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[1] Dr. Short, New Observations, &c., p. 77.

[2] Ibid., Comp. Hist., pref., p. i.

number of the former to the population is as great as 1 in every 89; while in the country places, where the prolificness is 4.77 to 1, the marriages are, nevertheless, only 1 in 155. So little truth is there in the idea that the "preventive check" regulates human fecundity.

(5) But, to obviate the objections which may possibly be urged against the proof as founded on a comparison of towns and country districts, where, it may be supposed, a variety of causes operate on human increase beside the one under consideration, let us pursue the inquiry distinctly and minutely, as it respects each situation. The following tables will determine whether, as it regards England, the objection to the general argument, which it is the purpose of this chapter to meet, is valid or otherwise. I have only to premise that the unentered marriages and baptisms, as enumerated in the abstracts of the registers in the last census, are added to the following calculation, in order to render the computations as complete and decisive as possible. Another column is likewise given (the last), in which the proportion of mortality is calculated on the inhabitants as in the first table of the Eighth Chapter of this Book.

TABLE XCIV.

DISPROVING THAT IN THE COUNTIES OF ENGLAND THE "PREVENTIVE CHECK" DIMINISHES THE FECUNDITY OF MARRIAGES, OR THAT THE NUMBER OF THE LATTER IS REGULATED BY THE PREVAILING DEGREE OF MORTALITY.

Counties.	Marriages, 1 in every	Number of Marriages.	Number of Baptisms.	Prop. of Baptisms to a Marriage.	Burials 1 in every
Middlesex . .	95	109,645	306,955		
Marriages one in less than every 100.				2.46	43
Southampton .	107	24,651	90,270		
Gloucester . .	107	28,894	93,441		
Marriages 1 *in* 100 *to* 110.		53,545	183,711	3.43	57
Lancaster . .	110	85,328	330,650		
Warwick . .	110	22,816	76,372		
York, E. Riding	113	15,353	58,276		
Cambridge . .	113	9,894	38,671		
Devon . . .	116	35,274	138,388		
York, W. Riding	116	62,122	235,901		
Bedford . .	117	6,546	24,051		
Stafford . .	117	27,103	108,167		
Marriages 1 *in* 110 *to* 120.		264,436	1,010,476	3.82	53
Huntingdon .	121	3,766	14,273		
Leicester . .	121	13,396	50,113		
Kent . . .	122	33,502	142,080		
Chester . . .	122	20,305	76,792		
Nottingham .	122	14,296	57,367		
Northampton .	123	12,356	45,606		
Norfolk . . .	123	25,782	106,469		
Lincoln . . .	125	20,892	88,990		
Suffolk . . .	127	19,885	79,137		
Marriages 1 *in* 120 *to* 130.		164,180	660,827	4.02	54

TABLE XCIV.—(*continued.*)

Counties.	Marriages, 1 in every	Number of Marriages.	Number of Baptisms.	Prop. of Baptisms to a Marriage	Burials,
Worcester . .	130	13,188	54,580		
Bucks . . .	132	9,525	39,438		
Durham . .	133	14,837	62,702		
Wilts . . .	133	15,654	60,885		
Sussex . . .	134	15,789	71,138		
York. North Rg.	135	12,432	52,576		
Northumberland	135	14,027	52,731		
Rutland . .	135	1,286	5,315		
Somerset . .	135	24,366	97,482		
Surrey . . .	135	27,450	101,242		
Cornwall . .	136	17,383	76,601		
Berks . . .	138	9,301	39,451		
Cumberland .	139	10,369	47,265		
Marriages, 1 *in* 130 *to* 140.		185,607	761,406	4.10	5
Dorset . . .	140	9,564	40,970		
Oxford . . .	140	9,131	40,493		
Derby . . .	140	14,236	61,734		
Essex . . .	141	19,736	83,892		
Westmoreland .	143	3,385	14,968		
Monmouth . .	145	4,696	15,441		
Salop . . .	147	13,613	59,682		
Marriages, 1 *in* 140 *to* 150.		74,361	317,180	4.27	5
Hereford . .	158	6,212	28,079		
Marriages, 1 *in* 150 *to* 160.				4.52	[illegible]
Hertford . .	167	7,406	38,431		
Marriages, 1 *in* 160 *to* 170.				5.18	[illegible]

(6) The foregoing table settles, beyond the possibility of dispute, as far as the population of England is concerned, not only the main objection against the principle demonstrated in the preceding parts of this book, namely, that the diminishing ratio of fecundity is occasioned by the prevalence of the "preventive check," and not by the law of human increase, as previously expounded; but also the equally unfounded idea that the postponement of marriages, the favourite nostrum of our anti-populationists, diminishes human prolificness, and the still more monstrous notion, even as applied to the crowded community of England, that deaths make room for marriages. With the exception of the metropolitan county, where the mortality is, of course, the highest, in consequence of the vast accumulation of individuals in the capital, the proportion of deaths has not the least apparent influence on that of the marriages, while the prolificness of the latter increases with a surprising degree of regularity as their relative number diminishes; not only, therefore, totally silencing the arguments founded upon the preventive check, as it is called, as objections to the principle at issue, but converting them into strong and additional proofs in its favour.

(7) The highly curious and important facts developed in the preceding table, are of a character far too certain and regular to be the results of chance; and if they are produced by a law of nature, it will of course be in general operation. Let us, therefore, examine the movements of the population of France with a view to the same subject, though the more even distribution of the inhabitants, and the greater uniformity in the habits, of that country, compared with England, will prevent us from expecting it to be so decidedly developed. I take, therefore, the follow-

ing facts from three tables, pages 25, 26, 27, 31, 32, 33, 52, 53, and 54, in the 12th volume of the Bulletin des Sciences Géographiques, &c.; which were, of course, calculated with no view whatever to the present argument, and consequently free from the suspicion of having been managed so as to support it. The first column of figures gives the proportion of marriages in each of the departments of France; the second, their average prolificness; and the third, the proportion of deaths. I have to observe, that, in the first column, the annual proportion of the marriages is calculated on a radix of one hundred thousand inhabitants; in the second is given the average number of births to each marriage; and in the third, the annual number of the deaths to every thousand of the population. The difference in these radixes is occasioned by the results being taken from different tables, though all were calculated from facts belonging to the same period. This table will be accompanied by no remarks, as none are required, the facts it presents shewing, in the most regular and decisive manner throughout, that, instead of the preventive check diminishing the prolificness of marriages according to the doctrine so much relied upon by our anti-populationists, on the contrary, in proportion as it prevails, does that prolificness gradually increase.

TABLE XCV.

DISPROVING THAT IN FRANCE THE PREVENTIVE CHECK DIMINISHES THE FECUNDITY OF MARRIAGES, OR THAT THE NUMBER OF THE LATTER IS REGULATED BY THE PREVAILING DEGREE OF MORTALITY.

Departments.	Marriages to every 100,000.	Births to a Marriage.	Deaths to every 1000.
Manche	505	4.65	20.28
Aveiron	514	4.39	24.44
Seine Inférieure . . .	527	3.41	26.21
Hautes Pyrenées . . .	532	4.90	18.67
Cantal	558	4.42	22.42
Jura	567	4.87	25.41
Vendée	568	5.47	27.37
Mayenne	581	4.88	22.50
Haute Marne	589	4.29	21.05
Basses Pyrenées . . .	598	4.29	19.81
Arriège	598	4.76	22.59
		50.33	250.75
		4.58	22.80
Lot	610	4.17	23.14
Orne	617	3.86	19.90
Lozère	623	4.51	27.27
Loire Inférieure . .	629	4.66	22.14
Deux Sèvres	635	4.24	20.75
Nièvre	642	4.29	21.38
Var	643	4.53	28.73
Ain	647	4.63	28.55
Tarn	650	4.59	26.03
Calvados	650	3.16	20.49

Table XCV.—(*continued.*)

Departments.	Marriages to every 100,000.	Births to a Marriage.	Deaths to every 1000.
Tarn et Garonne	653	3.82	23.50
Hautes Alpes	656	5.23	29.17
Charente	660	4.29	22.92
Haute Loire	661	4.52	25.99
Gers	661	3.59	21.90
Doubs	665	4.45	24.52
Morbihan	681	4.89	30.75
Isère	687	4.53	25.23
Aude	688	4.37	27.37
Hérault	692	4.44	26.79
Creuse	692	4.34	21.26
Vosges	695	4.13	21.80
Bas Rhin	696	5.09	25.77
Basses Alpes	697	4.72	27.81
Pyrenées Orientales	698	5.07	30.33
Gard	698	4.75	28.45
Moselle	699	4.65	23.32
Côte d'Or	699	4.02	22.70
		12.354	697.96
		4.41	24.92
Meurthe	700	4.39	25.99
Côte du Nord	704	4.73	28.58
Pas de Calais	705	3.99	22.57
Correze	706	4.69	26.10
Somme	708	4.01	24.32
Lot et Garonne	708	3.23	21.06
Dordogne	708	3.90	26.19

Table XCV.—(*continued.*)

Departments.	Marriages to every 100,000.	Births to a Marriage.	Deaths to every 1000.
Maine et Loire . . .	710	3.82	29.93
Meuse	711	4.38	25.08
Haut Rhin	728	4.70	25.83
Finistère	729	4.66	26.22
Indre et Loire . . .	731	3.87	21.02
Ille et Vilaine . . .	733	4.09	28.18
Eure	734	3.20	22.98
Drôme	735	4.31	25.73
Nord	740	4.37	27.06
Rhône	743	4.07	28.13
Saône et Loire . . .	747	4.35	27.23
Puy de Dôme . . .	751	3.93	24.61
Loire	752	5.01	29.51
Vaucluse	753	4.81	31.20
Landes	757	4.31	29.24
Haute Garonne . . .	759	4.02	28.86
Yonne	761	3.64	22.41
Bouches du Rhône . .	763	4.37	31.58
Aube	764	3.84	22.20
Sarthe	768	3.65	20.07
Ardèche	772	4.28	24.82
Haute Saône	775	3.99	22.77
Ardennes	779	3.93	23.69
Indre	782	4.36	26.11
Vienne	787	3.60	21.29
		132.50	821.56
		4.14	25.67

TABLE XCV.—(*continued.*)

Departments.	Marriages to every 100,000.	Births to a Marriage.	Deaths to every 1000.
Charente Inférieure	802	3.81	28.43
Marne	805	3.86	26.63
Eure et Loire	807	3.71	23.74
Loiret	808	3.98	28.96
Gironde	808	3.26	23.29
Loire et Cher	809	3.87	25.82
Haute Vienne	816	4.39	28.92
Oise	816	3.38	24.04
Aisne	821	4.03	25.63
Seine et Oise	825	3.43	26.02
Allier	862	4.08	27.83
Seine et Marne	867	3.76	25.86
Cher	881	4.10	28.40
		49.66	343.57
		3.82	26.43
Seine	920	2.63	30,83

(8) The following table is collected from the results already presented in detail in the ninth chapter of this book, relative to the same country; and as the computation is formed on a different principle, and embraces a somewhat different period, extending to five years, it will give an additional, though it is conceived, an unnecessary, corroboration of the principle in question.

TABLE XCVI.

DISPROVING FROM A PRECEDING CALCULATION (TABLE LXVI.) THAT THE PREVENTIVE CHECK DIMINISHES THE FECUNDITY OF MARRIAGES, OR THAT THE NUMBER OF THE LATTER IS REGULATED BY THE PREVAILING DEGREE OF MORTALITY.

Proportion of Marriages, 1 in every	Number of Departments.	Legitimate births to a Marriage.	Deaths, one in every
110 to 120 . .	4	3.79	35.4
120 to 130 . .	15	3.79	39.2
130 to 140 . .	23	4.17	39.0
140 to 150 . .	18	4.36	40.6
150 to 160 . .	10	4.43	40.3
160 to 170 . .	9	4.48	42.7
170 and upwards	6	4.84	46.4

(9) It is perhaps superfluous to remark, that the first proportion of prolificness given in the preceding table would have sunk considerably, had it been calculated upon the total number of the marriages and births of the four departments, instead of the mean proportion of their prolificness taken separately; one of those departments, and far the most populous of the whole, being the Seine, in which the legitimate children to a marriage do not amount to 2.6.

(10) It is almost needless to remark, that the proportions of marriages are the fewest in the most thinly peopled parts of the country; in which also it is an universally acknowledged fact that longevity prevails in the greatest degree; but the idea that the proportions of deaths and marriages are so regulated as that the former make room for the latter, a single glance

at the foregoing tables disproves; indeed, that they have no mutual relation whatever, those of England fully shew.

(11) Will any one, therefore, with the knowledge of the preceding facts thus placed before him, have the hardihood to assert that numerous and consequently early marriages are, on the average, attended with the most children, or contend that deaths make room for weddings? And, deprived of these specious objections, how can the law of population, as demonstrated in the preceding calculations, be assailed even with the shew of a remaining argument? The proportion of the mortality in England (exclusive of the metropolitan county) varies only about 13 per cent.: that of the marriages, nearly 60 per cent. In France, with a similar exception, the differences, according to the last table, are, in the former 18 per cent., in the latter above 80 per cent.: shewing, as clearly as facts and figures can indicate any thing, that a much larger proportion marry where the population is crowded, than where it is more thinly scattered; as indeed several preceding tables had already proved, as well as the main point sought to be established in this chapter, namely, that as far as the preventive check operates, it operates to the increase of the fecundity of marriages.

(12) I shall now briefly refer to Prussia. The prolificness of marriages in the different provinces of that monarchy in 1784, as given by Busching, are presented in a preceding (the tenth) chapter. But neither is the variation in the prolificness there, confirming as it does most precisely the law of population, caused by the "preventive check," in as much as that variation proceeds, as in all the preceding instances, on an opposite principle. Thus, where the marriages

did not amount to 1 in 140 of the inhabitants, as was the case in four of the provinces, viz. Halberstadt, Brandenburgh, Magdeburg, and New Mark, the mean prolificness of each was 4.62 children; where the marriages were 1 in from 120 to 140, which was the case in East Friesland and Pomerania, there the children to each were 4.49; where the marriages were 1 in from 100 to 120, namely in Minden and Ravensburg, Ticklingburg and Lingen, East Prussia, Guelderland and Neufchatel, there the children to each were 4.33; and lastly, where more than 1 in every 100, as was the case in the provinces of Cleves, Mœurs, and West Prussia, there the children were only 4.24 to a wedding. The comparative mortality, mean while, in the different provinces affording not the slightest proof that deaths "make room" for weddings.

(13) It is surely unnecessary to pursue this subject. One other country, however, remains; and to that we shall extend the inquiry, inasmuch as it has been already specially referred to, as exhibiting in the movements of its population those deviations from its general regulations, which are, nevertheless, included in the very principle of the theory, and which have been found in this particular also still subserving its one design. On the point under consideration, however, even that country will be found no exception to that universal rule, which negatives all that has been said with so much confidence and pertinacity concerning the preventive check. I allude to the kingdom of the Netherlands. The following table exhibits the necessary facts relative to that country, as given in Table LXXVII., arranged with a view to the present argument[1].

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[1] See Quetelet, Recherch. sur la Pop., &c., des Pays-bas.

TABLE XCVII.

DISPROVING THAT, IN THE PROVINCES OF THE KINGDOM OF THE NETHERLANDS, THE "PREVENTIVE CHECK" DIMINISHES THE FECUNDITY OF MARRIAGES, OR THAT THE NUMBER OF THE LATTER IS REGULATED BY THE PREVAILING DEGREE OF MORTALITY.

Provinces.	Marriages, 1 in every	Births to a Marriage.	Mean Propor.	Deaths, 1 in every	Mean Propor.
Limbourg . .	90.3	3.09		47.5	
Marriages 1 *in under* 100.		3.09	3.09	47.5	47.5
North Holland .	104.4	4.50		34.5	
South Holland .	113.3	4.74		38.	
Zeland . . .	113.7	5.49		31.4	
Utrecht . . .	118.2	4.86		36.3	
Marriages, 1 *in* 100 *to* 120.		19.59	4.89	137.2	34.3
Overyssel . .	121.9	4.60		43.5	
Frise . . .	128.7	5.75		46.1	
Drenthe . . .	130.3	4.69		55.	
Gueldres . .	131.1	4.75		53.7	
Hainault . .	136.5	4.98		51.1	
West Flanders .	137.7	5.01		40.7	
Marriages, 1 *in* 120 *to* 140.		29.78	4.96	290.1	48.3
South Brabant .	142.2	5.45		38.2	
Anvers . . .	142.9	4.65		48.8	
Groningue . .	149.3	5.17		49.3	
Luxembourg .	149.9	5.37		53.8	
North Brabant .	150.	5.14		51.4	
Liege . . .	154.1	5.33		46.2	
Marriages, 1 *in* 140 *to* 160.		31.11	5.18	287.7	47.9
East Flanders .	165.3	5.82		44.8	
Marriages, 1 *in* 160 *and upwards*.		5.82	5.82	44.8	44.8

(14) Thus is it that the statistics of the Kingdom of the Netherlands also silence the sole objection that can be urged against the truth of the principle advanced in this treatise. In that country, which it has been so confidently asserted affords such striking proofs that the number of marriages is regulated with an almost miraculous precision[1], by the number of the deaths, which had first to make room for them, we see that on any accurate method of calculation the very reverse is the fact; and as it respects the subject under immediate consideration, if the preventive check operate, it operates to the increase of the fecundity of marriages.

(15) But it has been shewn, in a preceding chapter, that the prolificness of marriages in towns is regulated by their population diminishing as the inhabitants augment; it may not, therefore, be superfluous to the argument to examine whether the still greater difference, which has been found to exist in the degree of fecundity in such places, is occasioned by what is called the preventive check. The following table will suffice to determine this point: I shall only premise, that one or two of the first and last sections exhibit proportions which are the result of extraneous circumstances, as explained in the population abstracts, and previously alluded to. I do not, therefore, claim the results, as it respects these instances, to the full extent in which they appear to favour the general principle. It will be perceived, however, that the argument would not suffer, if they were omitted altogether.

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[1] Malthus, Essay on Population, pp. 241, 242.

TABLE XCVIII.

DISPROVING THAT IN THE TOWNS OF ENGLAND THE PREVENTIVE CHECK DIMINISHES THE FECUNDITY OF MARRIAGES, OR THAT THE NUMBER OF THE LATTER IS REGULATED BY THE PREVAILING DEGREE OF MORTALITY[1].

Towns.	Marriages, one in every	Number of Marriages.	Number of Baptisms.	Baptisms to Marriages.	Burials one in every
Chester	52	3440	6192		
Marriages 1 *in under* 60.				1.80	39
Plymouth	61	9635	23646		
Worcester	62	2475	5269		
Manchester . . .	63	18258	31530		
Bristol	65	12549	24478		
Portsmouth . . .	66	6519	18049		
Wigan	66	2411	7426		
Derby	68	2250	4952		
Lancaster	69	1395	3886		
Gloucester . . .	70	1274	3573		
Falmouth	74	563	2000		
Lichfield	74	743	1693		
Newcastle (Tyne) .	76	4081	10729		
Liverpool	77	13810	40989		
Kendal	79	1032	2980		
Marriages, 1 *in* 60 *to* 80.		76,995	181,200	2.35	44
Bath	82	4136	9061		
Leicester	84	3150	8494		
Birmingham . . .	86	11213	27232		
St. Albans	86	470	1749		
Peterborough . . .	88	469	1389		
Oxford	89	1629	4464		
Ipswich	89	1716	4412		
Exeter	89	2382	5497		

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[1] Abstracts, Parish Registers, 1811 and 1821.

TABLE XCVIII.—(*continued.*)

Towns.	Marriages, one in every	Number of Marriages.	Number of Baptisms.	Baptisms to Marriages.	Burials, one in every
Hull	89	3084	7408		
Kidderminster	90	967	3115		
Hereford	90	907	2343		
Coventry	90	2175	6692		
Nottingham	91	4064	11941		
Metropolis	92	120605	284897		
Norwich	92	4760	13292		
Colchester	93	1420	3893		
Reading	94	1253	3327		
Canterbury	94	1218	4457		
Northampton	94	1021	2423		
Dover	95	1016	3946		
Maidstone	95	1150	4440		
Sunderland	96	1407	4715		
Brighton	96	1883	5359		
Shrewsbury	96	1991	5808		
Leeds	98	7445	22905		
York	98	1984	6092		
Weymouth	98	576	1935		
Ely	98	471	1860		
Lewes	99	671	1678		
Yarmouth	99	1808	6412		
Marriages, 1 *in* 80 *to* 100.		187,036	471,236	2.52	46
Abingdon	101	490	1283		
Warwick	101	730	2216		
Whitehaven	101	1128	4451		
Harwich	102	380	1292		
Chatham & Rochester	103	3000	8653		
Newark	103	739	2463		
King's Lynn	104	1085	4009		

TABLE XCVIII.—(*continued.*)

Towns.	Marriages, one in every	Number of Marriages.	Number of Baptisms.	Baptisms to Marriages.	Burials, one in every
Doncaster	104	743	2511		
Tewkesbury	105	465	1208		
Bridport	106	345	1216		
New Sarum . . .	107	794	2464		
Stafford	109	485	1876		
Carlisle	109	1281	4735		
Scarborough . . .	109	713	1982		
Poole	110	509	1526		
Bedford	110	457	1067		
Windsor	111	534	1933		
Bridgewater . . .	113	491	1982		
Taunton	114	678	1833		
Maldon	115	255	812		
Aylesbury	116	338	1281		
Saffron Walden . .	117	322	994		
Bury St. Edmunds .	117	767	2673		
Lincoln	117	820	3061		
Cambridge	117	1081	3543		
Marriages, 100 *in* 1 *to* 120.		18,630	61,064	3.22	44
Durham	120	691	2714		
Blandford	121	209	649		
Stamford	122	394	1416		
Sudbury	122	303	981		
Buckingham	122	273	943		
Chichester	125	551	2166		
Huntingdon	125	206	726		
Southampton . . .	126	907	3299		
Lyme Regis	127	168	668		
Launceston	128	154	622		
Sandwich	129	218	1048		

TABLE XCVIII.—(*continued.*)

Towns.	Marriages, one in every	Number of Marriages.	Number of Baptisms.	Baptisms to Marriages.	Burials, one in every
Thetford	132	199	763		
Dorchester . . .	133	199	584		
Winchester . . .	133	541	2033		
Shaftesbury . . .	135	205	764		
Marriages 1 *in* 120 *to* 140.		5218	19,376	3.71	52
Newbury	142	364	1446		
Richmond, (Yorkshire)	143	231	1004		
Marlborough . . .	144	195	923		
Guildford	144	213	1066		
Sherburn	144	243	846		
Cirencester . . .	144	329	1197		
Evesham	146	224	776		
Monmouth . . .	149	257	1000		
Ludlow	150	301	1323		
Beverley	151	471	2384		
Devizes	152	261	834		
Droitwich	156	136	827		
Bridgenorth . . .	185	275	1252		
Marriages, 1 *in* 140 *to* 160.		3500	14,878	4.25	53
Wallingford . . .	163	122	543		
Hertford	164	242	1236		
Marriages, 1 *in* 160 *to* 180.		364	1779	4.89	49
Deptford and Greenwich	191	2023	12032		
Berwick on Tweed .	225	365	1252		
Woolwich	242	701	7082		
Wareham	325	56	262		
Newcastle Lyne . .	342	193	2331		
Marriages, 1 *in* 180, *& upwards*		3338	22,959	6.87	32

(16) No remarks will, I think, be considered necessary on the evidence this and the preceding tables afford to the truth of the principle in question. An observation or two may, however, be added, in explanation of the remarkable proportions of the marriages to the population, which some of its first and concluding sections exhibit. It is perfectly clear that the great relative number of the weddings in some of its first divisions, is occasioned by one of two circumstances, or, perhaps, partly by both of them; either by the constant supply of unmarried individuals of both sexes, in the prime of life, who resort to the towns of the kingdom, and marry there, or by the marriages which are celebrated in such places being formed by persons belonging to the adjacent parts of the country. Then, as it respects some of the towns in the last section, it is a notorious fact that, in consequence of their vicinity to London, the marriages which ought to occur in those places, as the residence of the parties contracting them, are actually celebrated in the metropolis. To these remarks must be added a still more important one, namely, that numbers of individuals, already married, resort to the towns of the empire, and have children born to them there; whereas few, comparatively speaking, in the prolific season of life, and especially amongst the great mass of the community, leave the towns and repair to the country districts; a fact which ought to convince us that the prolificness of towns appears too high as given in the registers, as compared with that of country places.

(17) But as, in a preceding stage of the argument, historical proofs have been adduced in confirmation of the law of population, when it was shewn that, as the inhabitants of different countries and

places have increased, the prolificness of marriages has sensibly diminished, so I shall conclude this chapter by shewing that such diminution is not attributable to the increased prevalence of the preventive check, although this has been confidently alleged by those who, being compelled to admit a fact universally acknowledged, have attempted to evade its import by that gratuitous assertion.

(18) In proof that the "preventive check" has diminished, as the population of the different countries already examined has advanced, or, in other words, that the marriages have increased in a super-proportion, I need only remind the reader of the true method of calculating that proportion, explained, it is conceived, in the seventh and eighth Chapters of the preceding Book, and then refer him to any country where the facts necessary for determining the point have been recorded. Several countries have already been examined in reference to the subject, particularly France, Sweden, and England. Regarding France, nothing further shall be added; and I shall only allude again to Sweden, for the purpose of exhibiting once more the singular error into which the theory of superfecundity has betrayed its principal advocates. Mr. Malthus, noticing the diminished mortality of that country, says that "it must have been occasioned by the increased operation of the preventive check." From another calculation which he received from M. Nicander, he thus deduces the same conclusion, "according to M. Wargen-"tin as quoted by Sussmilch, five standing marriages "produced yearly one child; but in the latter period," (about the termination of the last century,) "the pro-"portion of standing marriages to annual births was as "$5\frac{1}{100}$, and subtracting illegitimate children, as $5\frac{1}{10}$ to "1, a proof that, in the latter period, the marriages

"had not been quite so early and so prolific[1]." Now how stand the facts regarding this point? This author himself states, on the authority of Wargentin, that, a little after the middle of the last century, the proportion of marriages to the population, on the average of a few years, was 1 in 112, and of the deaths, 1 in 344. In 1805, the mortality had sunk, it appears, to 1 in 40.92. As he has not given the results of the enumeration of 1823, I will supply the omission. The proportions then were, of the marriages, 1 in 112; precisely the same as at the first period referred to, and of the deaths, 1 in 47.95. Now supposing the population to have been stationary, in every 10,000 births there would have been, at the first period, 6204 persons married; at the last, 8562; leaving out of consideration second marriages, which being, doubtless, about proportionably numerous in both cases, cannot affect the question. But the population was not stationary during the interval, but, on the contrary, it had augmented about one half; and the effect of that augmentation is such as still further to strengthen the general conclusion, at which we have already arrived. So far, therefore, from the truth is the supposition regarding the increasing operation of the preventive check in that country. The acknowledged diminution, therefore, in the fecundity of standing marriages, remains in full proof of the position, that human prolificness diminishes as population increases.

(19) Respecting England, few words will be required to negative the notion that the operation of what is denominated the preventive check increases. Towards the conclusion of the seventeenth century, the proportion of marriages to the population was, as has been already shewn, computed to be 1 in 134. But

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[1] Malthus, Essay on Population, p. 209.

now, taking the whole of the first twenty years of the present century into the account, and calculating by the mean number of the marriages, and the mean amount of the population during this time, as beyond all doubt the most unexceptionable method, that proportion has risen to 1 in 121. Taking, then, into consideration the increased duration of life at the latter date, which necessarily accumulates so much larger a number of co-existing individuals from the same number of births; can any supposition be more opposite to truth than that which assumes this check to have increased? On the contrary, its diminution is not only certain at present, but it has been shewn to be on the decline during the period in question, by an authority, whom, strange to say, Mr. Malthus has quoted in support of a directly contrary conclusion, I mean the indefatigable Dr. Short. He says expressly, that "the numbers which "die of late in celibacy, seem far short of what they "were before[1];" and he goes on to determine the proportion of that excess. But I shall pursue the subject no further. It is ridiculous to speak of the increasing prevalence of the preventive check in this country, as it respects the great mass of the community, whose numbers alone govern the question; it is worse than ridiculous, when we reflect that those who, when they have to make good their abhorrent theory, emphatically dwell on the effects of this check, can, nevertheless, when they resolve it into a practical question, turn round and inveigh against the early and improvident marriages of the poor, that is, of the vast bulk of the people of England.

(20) It may, perhaps, have been noticed, that no references have been made to the proportion of the

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[1] Dr. Short, New Observations, &c., p. 74.

marriages of Ireland and the United States of America; two countries nevertheless which have been specially appealed to in the preceding chapters, in support of the law of population. The argument is foregone as it regards those countries, for this conclusive reason, namely, because the documents are not in existence respecting them which only could enable us to pursue it; the marriages not being regularly registered, much less is their number known or published in either country. It would be too absurd, however, to suppose that the principle of population, which has been already thence demonstrated with such certainty and precision, and which conforms so exactly to what has been proved to be its operation in other countries, should be reversed as it regards these, in this one unnoticeable particular.

(21) But to conclude, by referring to the entire argument of this chapter. Seeing the evidence of decisive, uniform, universal facts as to this subject, will the assertions that, relatively speaking, deaths make room for marriages; that these again are restrained by the prevalence of the preventive check, which increases in its operation as population accumulates; and lastly, that the prolificness of marriages is diminished in proportion as that check prevails, be any longer hazarded—forming, as they do, essential parts of a theory as degrading to philosophy and truth, as it is injurious to the feelings and interests of human beings.

CHAPTER XIX.

OF THE LAW OF POPULATION; AS PROVED BY THE EFFECT UPON HUMAN PROLIFICNESS OF ANY CONSIDERABLE DIMINUTION OF INHABITANTS.

(1) THE next branch of the argument is of a singularly curious and important nature. It may indeed be regarded as little more than a corollary of the general principle, and as establishing it by a series of converse proofs; but it is of such a character, as most powerfully to arrest our attention, and it must be regarded as amounting to a moral demonstration of the theory for which I contend, at least with such as admit the system of Nature to result from Supreme wisdom and benevolence. It is this: the fecundity of marriages increases with the diminution of population.

(2) Happily for mankind, the instances of a considerable decrease in the inhabitants of any country or district are of rare occurrence, and the periods at which such diminutions have taken place are mostly remote from our times. It has been already observed, that an advancing population has been almost invariably accompanied by a greater diffusion of the comforts and conveniencies of life; has spread cultivation, meliorated climate, secured and equalized the products of the earth, and extended the limits of human life. Above all, those sweeping calamities, plagues and epidemics, whose office it is, according to the doctrine of some, to clear the world of its

redundant numbers, and particularly, in the absence of the "preventive check," have therefore almost disappeared. As, then, the most signal instances of local depopulation are, as before observed, distant from us in point of date, and as they occurred at times when statistical facts were not sufficiently attended to, the argument must forego what would otherwise, I am persuaded, have constituted its most striking proofs; it will, however, be hardly less conclusive, it is hoped, when formed of those inferences which flow from recorded and undeniable facts.

(3) Before I enter upon the subject, I must again remind the reader that three fourths of the births of any year result from the conceptions of the preceding one, the term of human gestation being three quarters of a year. As therefore we have no monthly accounts of births, the nearest approach we can make to correctness in our calculations respecting human prolificness is to assume the births of any given year as resulting from the incipient fecundity of the foregoing one. For want of attending to this obvious fact, very incorrect statements have been made, and erroneous conclusions drawn regarding the variations in the prolificness of marriages under different circumstances and at distinct periods. Mr. Milne, however, has not in his valuable work fallen into this common error, but has been amongst the first to calculate the prolificness of any particular year by the births of the succeeding one.

(4) I now proceed to prove, that human prolificness increases with any considerable diminution of population. I shall demonstrate this, in the first place, by shewing the effect of fatal epidemics on the registers of the cities or countries where they have occurred; and, as will probably be expected,

shall commence with the plagues which have so often devastated our own metropolis, confining myself, of course, to the period during which registers have been regularly kept and published. I therefore present the births and deaths of London, from the commencement of the seventeenth century, till a few years after the last great plague, distinguishing in the mortality the number of those who died in consequence of those dreadful visitations; such being all the facts on the subject, relative to this country, of which we are in possession, at least which I have been able to obtain.

TABLE XCIX.

EXHIBITING THE DEATHS (DISTINGUISHING THOSE BY THE PLAGUE) AND THEIR INFLUENCE ON THE CONTEMPORANEOUS CONCEPTIONS IN THE CITY OF LONDON, DURING 70 YEARS[1].

Year.	Deaths.	Besides of the Plague.	Total of Deaths.	Conceptions.
1601	near 6000	..	near 6000	near 6000
2	near 6000	..	near 6000	4789
3	5773	36,269	42,042	5458
4	4323	896	5219	6504
5	5948	444	6392	6614
6	5796	2124	7920	6582
7	5670	2352	8022	6845
8	6758	2262	9020	6388
9	7545	4240	11,785	6785
1610	7486	1803	9289	7014
	61,299	50,390	111,689	62,979

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[1] Birch, Collection of the Yearly Bills of Mortality. Corbyn Morris, Growth of the City of London. Major Graunt, Observations.

Year.	Deaths.	Besides of the Plague.	Total of Deaths.	Conceptions.
1611	6716	627	7343	6986
12	7778	64	7842	6846
13	7503	16	7519	7208
14	7367	22	7389	7682
15	7850	37	7887	7985
16	8063	9	8072	7747
17	8280	6	8286	7735
18	9596	18	9614	8127
19	7999	9	8008	7845
1620	9691	21	9712	8039
	80,843	829	81,672	76,200
1621	8112	11	8123	7894
2	8943	16	8959	7945
3	11,095	17	11,112	8299
4	12,199	11	12,210	6983
5	18,848	35,417	54,265	6701
6	7401	134	7535	8408
7	7711	4	7715	8564
8	7740	3	7743	9901
9	8771	..	8771	9315
1630	9237	1317	10,554	8524
	100,057	36,987	136,987	82,534
1631	8288	274	8562	9584
2	9527	8	9535	9997
3	8392	..	8392	9855
4	10,899	1	10,900	10,034
5	10,651	..	10,651	9522
6	12,959	10,400	23,359	9160
7	8681	3,082	11,763	10,311
8	13,261	363	13,624	10,150
9	9548	314	9862	10,850
1640	11,321	1450	12,771	10,670
	103,527	15,892	119,419	100,133

Year.	Deaths.	Besides of the Plague.	Total of Deaths.	Conceptions.
1641	11,767	1375	13,142	10,370
2	11,999	1274	13,273	9410
3	12,216	996	13,212	8104
4	9441	1492	10,933	7966
5	9608	1871	11,479	7163
6	10,415	2365	12,780	7332
7	10,462	3597	14,059	6544
8	9283	611	9894	5825
9	10,499	67	10,566	5612
1650	8749	15	8764	6071
	104,439	13,663	118,102	74,397
1651	10,444	23	10,467	6128
2	12,588	16	12,604	6155
3	10,081	6	10,087	6620
4	13,231	16	13,247	7004
5	11,368	9	11,377	7050
6	13,915	6	13,921	6685
7	12,430	4	12,434	6170
8	14,979	14	14,993	5690
9	14,720	36	14,756	6971
1660	15,104	13	15,117	8855
	128,860	143	129,003	67,328
1661	19,791	20	19,811	10,019
2	16,542	12	16,554	10,292
3	15,347	9	15,356	11,722
4	18,291	6	18,297	9967
5	28,700	68,596	97,296	8997
6	10,740	1998	12,738	10,938
7	15,807	35	15,842	11,633
8	17,264	14	17,278	12,335
9	19,429	3	19,432	11,997
1670	20,198	6	20,204	12,510
	182,109	70,699	252,808	110,410

(5) Major Graunt, from whom and Corbyn Morris the above table is taken, refers us to three periods during its continuation, in which the then not uncommon scourge, the plague, was most destructive: first, that in 1603, when there were nearly 40,000 victims, and when, probably, the calamity fell almost as heavily on the inhabitants, considering their number, as in the last and more memorable instance. Hume, indeed, informs us, that one fifth of the people died at this period[1]! Tremendous must have been the havoc among the prolific portion of the population, as well as among all others, yet, the conceptions in that very year, according to the births of the ensuing one, were about as numerous as usual! In 1601 and 1602, the births are stated to have been "near 6000;" in 1604, the conceptions were 5458; in 1605, they were 6504, and still higher in the two next years.

(6) In 1625, perhaps, a much greater number died of the same epidemic, which, moreover, had probably been committing its ravages for a year or two previous, though not distinctly noticed, except by the undue proportion in the number of the burials. Probably 50,000 or 60,000 were swept off at that visitation. The conceptions, however, of the fatal year, only fell short of the average number of the ten preceding years, by about one sixth, and the very next ensuing one even surmounted that average by several hundreds.

(7) In 1636, the city was again visited by the same dreadful calamity, which, though apparently not so fatal as the preceding ones, yet seems to have continued for a considerable length of time, and it is most singular to observe, that the conceptions greatly increased in number, for several successive years, imme-

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[1] Hume, Hist. of England, vol. vi. p. 14.

diately afterward, though it was long before the burials again became so high, as at that period, if reckoned independently of those occasioned by the contagion.

(8) The history of the Great Plague, as it is emphatically called, is too well known, to render it necessary for me more than to allude to the supposition that altogether nearly one hundred thousand of the inhabitants died of that dreadful disorder during the course of a few months. That this mortality must have dissolved an immense number of marriages needs not be remarked. One thing, however, may not at first sight be so obvious; which is, that the number of such dissolved marriages would not merely be in the proportion which their number previously bore to the entire population,—it would be much greater, for, though it takes, of course, two individuals to form one marriage, still the death of one of these obviously dissolves it, as effectually, as though both were to expire together. And it cannot be supposed, in such a general devastation, but that in numberless instances, long before the natural and average termination of the marriage union, " one would be taken and the other left." It is moreover asserted on all hands, that, contrary to the beneficent course which Nature takes in almost all other similar circumstances, this disease was peculiarly fatal to pregnant and lying-in females. But without entering into any minute, and at best, rather uncertain calculations, as to the number of marriages terminated, or those whom Graunt terms " teeming females" cut off by that dreadful pest, the amount of both, it cannot be doubted, was tremendously large. Is it not, therefore, a most surprising fact, and one completely decisive of the present question, that the conceptions of that year of death should have ex-

ceeded in number the average of the ten preceding years, by nearly one thousand; the next year by 2893; and the second following one, by a still vaster excess?

(9) These extraordinary facts have not been unnoticed by Major Graunt, as well as others. He indeed assigns a period as that in which the city has been repeopled, after each of these great plagues, and "affirms it to be the second year," and gives a reason for this opinion which I must controvert. "Now, "forasmuch as the cause hereof," says he, "cannot be "a supply by procreation, ergo, it must be by new "effluxes to London, out of the country." This reason, which, with one of another kind, passes current with the adherents of the theory I oppose, is manifestly erroneous. Major Graunt's explanation cannot co-exist with certain other laws of Nature, at least as sure in their operation, as those relating to procreation, and which will be found to guarantee the certainty of the fact for which I contend, that on any considerable diminution of numbers, human prolificness proportionally augments. It is true, we do not know the number of the marriages at the periods in question, but we can arrive at our conclusion, by quite as certain, though by a somewhat more circuitous method. Major Graunt speaks of the "seasoning," which new comers require on taking up their residence in London; other writers have dwelt upon the same subject, particularly Dr. Short, Dr. Price, Dr. Black[1]; nor is there the least ground for disputing the fact. The new comers, whom Major Graunt conceives replenished the wasted population of London so speedily, must therefore be subject to the law of mortality, in a somewhat undue degree, instead of

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[1] Dr. Black, Observations Medical and Political, p. 142.

being exempted from it: their children, too, (and it would strengthen my argument instead of his, to suppose them to be without the usual number of these) would be also liable to the full proportion of mortality, in a place and at a period so fatal to infant life. If then Major Graunt's solution had been true, and the increase in the births, which, as we have shewn, actually occurred, after these mortalities, had been occasioned by the advenæ flocking to London in multitudes at such a crisis, so as to replenish the population in the space of two years, with its full number of inhabitants; should not these accessions, during their seasoning, and subsequently to it, as well as their children, have added their full proportion to the register of the deaths? Doubtless at least that proportion. But such is not the fact. The two years succeeding the plague of 1603 give considerably fewer burials than the two preceding it. Nor was the next general plague of 1625, (followed immediately, as already pointed out, by years of increasing fecundity,) succeeded by an equal mortality. On the contrary, in the three years preceding that plague, the deaths amounted to 32,718; in the three years succeeding it, to 22,853 only: a difference of about one third! If it be objected that two of the years immediately preceding 1625 were probably more or less affected with that distemper, take the three years still preceding, and the number of deaths even in these amounts to 27,223; nearly one fourth more than in the latter period: a proof as sure as death itself, that the number of the inhabitants had not been yet restored; and as the births had nevertheless increased, the true "ergo" then is, that the fruitfulness of the remaining marriages had vastly increased. In the third instance, the contagion continued so long, that it is hardly possible to argue confidently from the degree of mortality which ensued: fourteen years afterwards it was lower than it had been for two or three years previous to 1636. But to proceed to the consideration of the remaining, and far more striking event. It is admitted that the burning of London, which followed the year after the great plague, would have the effect of drawing a great number of artificers thither. But, fortunately, there is room enough for the argument before the latter event could affect the question. Though the havoc made amongst the population must have undoubtedly sunk the number of the births, still we have already seen how greatly they exceeded the average. But, whereas in the two years immediately preceding the plague, and when the city appeared entirely free from that epidemic, the deaths were 33,638, in the two years next following that event they were 26,547 only; again nearly one third fewer in amount.

(10) That there have been at all times a considerable number of advenæ resorting to London, and especially at some of these periods, I do not mean to deny; but, unless the constant and irreversible law of mortality was suddenly changed in their behalf, and death, like the legislators of Columbia, exempted new comers from tribute for a certain number of years, in order to recruit the population, so great a diminution in the number of burials is totally inconsistent with the fact of a restored population; and the births therefore of those periods exhibiting this sudden and great increase in number, fully prove, as I conceive, the important fact for which I am now contending; namely, that the fecundity of human beings increases on any sudden diminution in their numbers.

(11) Times like these we have been considering are not precisely those in which we can expect scien-

tific men, even such as may have been induced from motives of humanity to expose their own lives to save those of others, coolly to collect and class the circumstances relative to such tremendous events, so as to theorise upon them. But it happens that the interesting fact now asserted has not been unnoticed on these occasions by competent and unimpeachable authorities. Dr. Hodges, who intrepidly braved the dangers of the last great plague of London, and became its authentic historian, asserts in his Loimologia, that "even women, reputed barren before, became prolific;" so great was the fruitfulness of that dreadful period[1].

(12) The great plague in Prussia, which occurred 1709-1710, was, on the united testimony of all accounts, one of the most fatal epidemics ever known in any nation. Sussmilch calculates that one-third of the people fell victims to it; and this indefatigable statistical writer particularly directs our attention to the great prolificness of marriages in that country after this thinning of their numbers. This circumstance is indeed sufficiently apparent from a glance at the registers he gives us; but those who have not been in the habit of studying such documents will be little aware of the full extent of the prolificness which these necessarily imply. The explanation, however, may be soon made, and as instantly comprehended. If one third of the population was destroyed at the period referred to, one third at least, and for reasons already advanced, above that proportion of the existing marriages was dissolved. A proportionate number of these were doubtless terminated in the period of their natural prolificness, and those of course yielded no more births to the ensuing registers. But

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[1] Hodges, Loimologia, p. 28.

the annual births for eighteen years succeeding this great mortality divided by the annual marriages during that period, give a far greater degree of prolificness than that of the eighteen years preceding that event, (a period which reaches to the commencement of the table,) when similarly calculated. Before the plague, the prolificness of marriages was, on the average, as 3.98 to 1; after that event, as 4.56 to 1: how greatly would the latter proportion appear augmented as compared with the former, had it been calculated on the number of the existing, instead of the annual marriages, at each period! It is clear from the other proportions that the population had not fully recovered itself till nearly half a century afterwards. So strikingly confirmatory are the Prussian registers of the fact pointed out by Sussmilch, that prolificness increases with any great or sudden diminution in the inhabitants of any particular country or district.

(13) Perhaps the plague which raged at Marseilles and the neighbourhood, early in the last century, (of which M. Bertrand has written so affecting an account,) hardly yielded in its severity to that of Prussia; and the consequences, in reference to the subject before us, were precisely the same as those already mentioned in regard to the latter: M. Moheau, like Sussmilch, calls the attention of his readers to the prolificness of marriages which immediately followed that calamity in the south of France.

(14) Nor has the observation of this fact been confined to the old world; the new, again, affords its unequivocal testimony to the true principle of human increase. Dr. Seybert has recorded that the same consequence succeeded the yellow fever in America, which, it has been shewn, followed the plagues of Europe; and has, by anticipation, met the only

objection that could be urged against the deduction I have drawn from it. He says, "in Boston, New York, "Philadelphia, and Baltimore, where the yellow fever "has occasionally prevailed, there has been an annual "increase in the inhabitants." "We cannot," he adds, "attribute this increase, as they do in other "countries, to the marriages that were influenced by, "or succeeded to, the mortality[1]."

(15) But this branch of the argument is too important, in all respects, to rest upon general observations and deductions. I shall, therefore, proceed to give it a more particular examination, appealing in its behalf to those documents which are already before the public.

(16) In the numerous tables of Sussmilch, so often appealed to, the epidemic years are marked by him with an asterisk, these (exclusive of those already attentively examined, and also of those found in the sections which are incomplete, the years not being consecutive, and consequently, useless for the present purpose) give the following results. The mortal years so distinguished, collected from the registers of the different countries, which he has published, are 116; the mortality in these years I make to amount to 1,041,346 souls. The same number of the most healthy years, selected, one by one, from every period from which the mortal ones are taken; or, where the latter are placed alone, which is sometimes the case, then from the most healthy year in the two preceding and two succeeding years, gives a total of deaths amounting to 770,054; an astonishing difference, amounting to 35 per cent., of which, thank God, we have no experience, and little idea, in this better peopled country. Contemplating, then, the

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[1] Dr. Seybert, Statistical Annals, p. 49.

dreadful havoc made among the standing marriages, or, in other words, the breeders, by this great excess of mortality, ought not the succeeding year to have exhibited, at least, a proportionate decrease in the number of births, on any other principle than that now advanced? The births, however, of the average years amounted to 1,053,605; and those in the years succeeding those great mortalities, to 1,032,090. The marriages, meantime, in the mortal years, instead of being increased, as Mr. Malthus supposes, were fewer by 2.305. Calculating the fecundity of the two classes of years, by dividing the amount of the births in each by the number of their respective marriages, we find that the quotient is almost precisely the same, namely, 3.7 to each. The only, and inevitable, conclusion, therefore, is, that the fecundity of the remaining breeders had been greatly increased, to keep up the same proportion of births, though the number of existing marriages was so vastly diminished[1].

(17) But it has been seen, in every preceding stage of the argument, that the law of population does not manifest itself in the extremes of the argument only, but indicates its existence by a series of intermediate results, graduated, if I may so speak, in conformity to the general principle, with the utmost regularity and precision. I shall, therefore, extend the present inquiry to deviations in the law of mortality, of a less striking character, confined within narrower limits than those hitherto instanced, in fact to such as are perpetually occurring; in order to determine whether the principle which forms the proof now particularly insisted on, is also in minute and constant operation.

[1] See the tables at the end of M. Sussmilch's volume, passim.

CHAPTER XX.

OF THE LAW OF POPULATION; AS PROVED BY THE EFFECT UPON HUMAN PROLIFICNESS OF GENERAL VARIATIONS IN THE LAW OF MORTALITY.

(1) HAVING shewn that the effects of fatal epidemics in any place or country, on the prolificness of the survivors, is in striking conformity to the principle of population, we shall now proceed to examine whether that principle does not receive a further confirmation in the influence which those slighter variations in the annual mortality of a population have upon the conceptions of the periods in which they occur. The very nature of the argument, indeed, demands that the effect should, in these latter cases, be less conspicuous; and it may likewise be rendered still more uncertain or obscure by those extraneous circumstances which will ever have some effect upon the movements of population; still, however, as such circumstances, in any considerable number of instances, may counterbalance each other, we may reasonably expect some indication of the principle at issue, in the facts about to be considered, if it is in reality a law of Nature.

(2) Let us recur, in the first place, to the London Bills of Mortality, in order to determine this matter; and to avoid the possibility of undue selection, take the thirteen years which Graunt has particularized as sickly ones. "Such," he says, "were "1618, 20, 23, 24; 1632, 33, 34; 1649, 52, 54, "56, 58, and 61, as may be seen from the tables." He adds, afterward, that "the more sickly the years

" are, the less fecund or fruitful of children also " they be[1]." If, however, he had recollected that the fairest method of determining upon the comparative fruitfulness of those years, is by the births of the immediately succeeding ones, he would have arrived at a very different conclusion. The actual deaths in those years amounted to 152,722; the average number, calculated upon his own octennial divisions of the term, to 142,838 only. Computed again on the average of those divisions, the births were 101,359; but the conceptions of the mortal years, given by our authority, amounted to 102,499. Now, to attribute this increase, under such circumstances, to affluxes from the country to the metropolis, in consequence of the room made by this excess of mortality, as he attempts to do when reasoning on the consequences of the plagues in London, were in this case, at all events, too absurd a supposition to be entertained for a moment. It would imply that new-comers took the room which a certain class of theorists assert deaths make for marriages, by anticipation.

(3) Before I conclude my references to this author, I shall again appeal to the registers of the three places which he has given in his work so often alluded to; those of a Country Parish, of Cranbrook, and of Tiverton, going through the several decades into which he has divided them, with the exception of one or two of the last, which reach into the time of the grand rebellion, in which the marriages were no longer celebrated by ecclesiastics nor regularly registered[2]. The following are the results collected, in the same manner as those from Sussmilch's tables. In the most mortal years in

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[1] Graunt, Observations on the Bills of Mortality, c. vi., § 2 and 3, p. 21.

[2] Ibid., Appendix, pp. 47, 48, 49, 50, 51, 52, and 53.

these three places, during a period of nearly a century and a half, divided into sections of ten years, the deaths amounted to 4199; in the most healthful ones, to 1394: a prodigious difference! In the former years were celebrated 720 weddings, and, calculated as before, the conceptions in these years, notwithstanding these devastations, amounted to 2949. In the latter, the weddings were 803; but the conceptions, nevertheless, were only 2730. The average weddings and conceptions were 724 and 2833. Notwithstanding the great diminution in the number of standing marriages which the mortality of the sickly years implies, in which, moreover, fewer annual weddings took place, the fecundity, calculated on 1000 of those annual weddings, is,

In the mortal years . . .	4096	children.
In the average years . . .	3919	—
In the healthiest years . .	3399	—

The difference exhibited by this calculation is strikingly confirmatory of the argument; though still it is little compared with what must be allowed to have existed, if the preceding remarks are properly attended to.

(4) I have already examined the tables of Sussmilch, as it respects the epidemic years, which, as before mentioned, he has himself indicated. I shall now make a more extensive use of the same important documents; and, for this purpose, I have collected from all the several sections (principally of five years each) which the whole of them contain, the most mortal year, its marriages and conceptions; next, the least mortal, or, in other words, the most healthful one in the same divisions, and its marriages and conceptions also; and, lastly, noted the average number of both these events, calculated likewise on their mean

number in each of the periods respectively; and this I have done throughout the whole of his tables, wherever their divisions presented an uninterrupted series of years, so as to enable me to ascertain the facts required. Of the following results, those relating to the comparative prevalence of marriage in mortal and healthful periods have already been given in a preceding book; these now added, more particularly concern the present argument, and, indeed, finally decide it. Taking from each of the divisions throughout, first, the deaths in the most mortal year, and next, those in the most healthful one, the former amount to 2,845,336; the latter to 2,409,761 only, a difference of nearly one-fifth, being about three-fold the variation that occurs in the mortality of this country. The marriages which were celebrated in these fatal years are, as has been before shewn, much fewer than those of the healthy ones; the former amounting to 774,098 only, the latter to 831,423. The average number of the marriages of the whole of these periods is 802,782; the average conceptions, 3,279,834. But the conceptions in these fatal years, notwithstanding, first, the diminution in the number of existing marriages by this super-proportion of mortality, and second, the diminution in the number of the annual marriages to the extent of 28,614, outnumbered the conceptions of the average years by 13,002; those of the former being 3,292,836; of the latter, as before mentioned, 3,279,834. Even in the most healthful years, in which, as has been previously shewn, the most room is invariably found for marriages, and in which, consequently, 831,423 weddings were celebrated, being 57,325 more than in the sickly years, and in which there must have been a more than average proportion of the marriages already existing, preserved and continued, there were only 2,338,063 conceptions[1]: a proportion which, even calculated on the annual marriages only, falls short of that of the average and mortal years in the following degrees:

Proportions of Conceptions to 1000 Marriages.

In the most healthy years	4015
In the average years .	4084
In the mortal years .	4254

(5) Nor do these results, decisive as they are, by any means exhibit to the full extent, for reasons which have been already explained, the excess of the fecundity of mortal years compared with that of the healthy, or even average ones. And were it our purpose to arrive at exact conclusions, another important consideration presents itself; the first year of the marriage state is, on the average, greatly more fruitful of conceptions than any succeeding one during its continuance. Now it has been seen how much the number of the marriages abates in the mortal years compared with those celebrated in the healthy ones; a very slight idea of calculation will therefore suffice to convince us, that this circumstance also ought to be taken into the account, in estimating the superior prolificness of the mortal years, which, thus rectified, would be still more strikingly apparent.

(6) Let it be recollected, that the decisive results just appealed to, are derived from no partial sources, nor made up of numbers and instances selected merely because they suited the argument; they are not derived from any one country, nor from particular situations in any part of the world, nor from any one period of time. On the contrary, they embody the entire facts as applicable to the present question, taken from the most extensive collection of tables ever presented

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[1] See Sussmilch's Tables, passim.

to the world, relative to this branch of statistics: they comprise every country in Europe which could furnish the necessary facts; and are collected from both the cities and country districts of each: they comprehend a period of time sufficiently extensive to render it impossible to suppose that the uniform deductions they present could be accidental or temporary. And lastly, the conclusion, though deduced from the grand totals, does not manifest itself there only, but is so indicated, in every separate document throughout the whole, as to render the nature of the result certain before their united testimony was collected. Is it too much, therefore, to conclude, that evidence furnished from such a variety of quarters, collected at such different periods, and of so universal a nature, can be otherwise than irrefragably conclusive?

(7) Anxious, however, to put a point of such great interest, as well as importance, to every possible test, I shall appeal more particularly to the statistics of this country; first to those of several of the principal towns in England, and finally to the official documents of the kingdom at large.

(8) I regret that Dr. Short's numerous and otherwise important tables, are in this, and other parts of the argument, of no use, in consequence of his having omitted to give his facts in consecutive years. The only other works in my possession, in which there is a considerable number of English registers, are those of Dr. Aikin and Sir Frederick Morton Eden. The former, in his History of Manchester, has given the registers of thirteen different towns; commencing with the periods in each in which the necessary facts are annually given. I find, that in the most mortal years, selected as before, the deaths amounted to 31,617, in the most healthful ones to 23,711: the registers of

the marriages are not quite entire; but as we are only entertaining the question of their comparative prolificness at different periods, this circumstance is of little importance. The total number of weddings in the mortal years amounts to 11,944; in the healthy ones, to 12,199. But, notwithstanding that in these instances, as well as in all others, the annual marriages in the mortal years were thus deficient in number, and that the dissolution of so many above the average annual number, by this excess of mortality, must have taken place, still the same uniform and striking fact, of the superior prolificness of the fatal years, comes out; there having been 38,706 conceptions in the mortal years, and only 36,482 in the healthful ones. The mean number of the conceptions, calculated on the whole of the divisions in the entire registers of all these places, is 37,749.

(9) Taking from Sir Frederick Morton Eden's History of the Poor the registers of the 88 places, which are the whole of those he has given with that regularity, which is necessary to render them available for the present inquiry, with the exception of those already included in Dr. Aikin's work, which the former seems to have copied from the latter, I divided them, as before, into sections of five years each, except in some cases, where another divisor comprehended more completely the whole number of the years recorded, which, I ought to have said, was the method adopted, in regard to the documents taken from Dr. Aikin: the registers of the large town of Manchester, however, I divided biennially on account of the great increase of its population, which would have frustrated any other method of arriving at a just conclusion regarding the principle at issue. In like manner, and for the same reason,

the registers of the towns of Liverpool and Sheffield given in the above work were also divided into alternate years. The results so obtained are comprehended in the following totals. In the most mortal years there died in these 88 places, 88,349; in the most healthy ones, 65,564, a difference of nearly 35 per cent.!—fatal, we may be certain, to great numbers of prolific marriages, as well as to many individuals in celibacy and in advanced age. But so far from the prolificness of these fatal years, or, as before explained, the births of the ensuing ones having been diminished, and in the degree the theory opposed would assume, they amounted to 92,052, whereas those of the healthful ones were only 90,287. We have already seen the error of supposing that years of sickness are those of marriage; in these instances the list of weddings is not quite complete, but as far as it goes, it fully corroborates all that has been previously advanced upon the subject. They amount, in the mortal years, to 22,039; in the healthful ones, to 22,152.

(10) Lastly, I shall examine, in reference to the present argument, the published registers of England, from the period when the baptisms, burials, and marriages are given annually, namely, from the year 1780 to 1820, when they terminate: and in doing so, the first fact which strikes our attention is the comparatively speaking equable rate of the annual mortality of the entire country, since the population has advanced so considerably, and consequently the comforts and conveniences of life have become more generally diffuse. Both the fact and the deduction are indisputable, notwithstanding they are utterly at variance with the theories of those who hold the opinion of the natural redundancy of human beings, and speculate on the means of its repression. It has been seen, however,

in the former stages of this argument, with what accuracy the principle of population adapts its operations to the slightest variation in the circumstances by which it is regulated; let us, therefore, examine whether the annual difference in the rate of mortality, slight as it comparatively speaking is, has not, in conformity with the position advanced in this chapter, some perceptible effect on human prolificness. If it has, the slightness of the variations in that fecundity will be a further confirmation of the principle at issue.

(11) I must premise, however, that one or more of the greatest variations in the amount of the births during the entire period is owing to a cause totally unconnected with the subject under consideration, namely, to the return of peace, which, as before observed, has necessarily a great effect on the fecundity of any year in which such an event occurs.

(12) In the following table, taken from the registers as published in the Censuses of 1801, 1811, and 1821; the forty years commencing with the conceptions of 1780, and terminating with those of 1819, (being the last year in which, according to the mode already explained, they can be given,) are divided biennially, and the whole equally classed according to the proportion of the deaths in each division.

TABLE C[1].

SHEWING, FROM THE REGISTERS OF ENGLAND, FOR THE LAST 40 YEARS, DIVIDED BIENNIALLY, THAT, IN THE MOST MORTAL YEARS, MARRIAGES ARE MOST FRUITFUL OF CONCEPTIONS.

Years.	Deaths.	Greatest Number.	Marriages in that Year.	Conceptions in that Year.	Fewest Deaths.	Marriages in that Year.	Conceptions in that Year.
1780	191,736	191,736	61,760	224,123			
1781	189,172				189,172	61,146	218,022
1782	180,914				180,914	61,834	214,579
1783	181,989	181,989	64,988	222,709			
1784	187,921	187,921	67,583	237,229			
1785	185,470				185,470	70,146	235,323
1786	179,058	179,058	67,639	237,653			
1787	178,718				178,718	69,067	243,085
1788	181,345	181,345	67,559	243,001			
1789	179,384				179,384	69,310	248,774
1790	178,731				178,731	73,263	247,765
1791	180,452	180,452	71,167	261,262			
1792	182,609				182,609	74,450	256,027
1793	196,865	196,865	71,451	249,029			
1794	191,149				191,149	70,390	247,218
1795	203,328	203,328	67,489	248,000			
1796	184,534				184,534	71,674	259,964
1797	184,929	184,929	73,526	262,337			

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[1] Abstracts, Parish Registers, 1801, 1818, and 1821.

TABLE C.—(*continued*).

Years.	Deaths.	Greatest Number.	Marriages in that Year.	Conceptions in that Year.	Fewest Deaths.	Marriages in that Year.	Conceptions in that Year.
1798	181,313				181,313	77,919	258,685
1799	183,267	183,267	76,036	247,147			
1800	201,128				201,128	68,481	237,029
1801	204,434	204,434	67,228	273,837			
1802	199,889				199,889	90,396	294,108
1803	203,728	203,728	94.379	294,592			
1804	181,177				181,177	85,738	292,201
1805	181,240	181,240	79,586	291,929			
1806	183,452				183,452	80,754	300,294
1807	195,851	195,851	83,923	296,074			
1808	200,763	200,763	82,248	299,989			
1809	191,471				191,471	83,369	298,853
1810	208,184	208,184	84,470	304,857			
1811	188,543				188,543	86,389	301,954
1812	190,402	190.402	82,066	314,432			
1813	186,477				186,477	83,860	318,806
1814	206,403	206,403	92,804	344,931			
1815	197,408				197,408	99,944	330,199
1816	205,959	205,959	91,946	331,583			
1817	199,629				199,629	88,234	331,384
1818	213,624	213,624	92,779	333,261			
1819	213,564				213,564	95,571	343,660
	7,656,210	3,881,478	1,510,627	5,517,975	3,774,732	1,561,935	5,471,930

(13) Any remarks upon the preceding table are superfluous. The results, which comprise all the facts already known, since the annual births, deaths, and marriages have been published, are, when thus biennially classed, as follow:—in the mortal years there were 3,881,478 deaths; in the healthy ones, 3,774,732; in the former there were celebrated 1,540,627 marriages, in the latter, 1,561,935; yet in the former years there were 5,517,975 conceptions, in the latter 5,471,930 only.

(14) I have also divided the foregoing table into sections of three and four years each, terminating in the former case with the year 1818. Leaving out the particulars of the computations, I present the results, together with the former ones, in the following table.

TABLE CI.

SHEWING, FROM THE REGISTERS OF ENGLAND, FOR THE LAST 40 YEARS, DIVIDED INTO SECTIONS OF 2, 3, AND 4 YEARS EACH, THAT MARRIAGES, IN THE MOST MORTAL YEARS, ARE THE MOST FRUITFUL OF CONCEPTIONS.

MORTAL YEARS.			
Divisions.	Mortal Year of each Division.	Marriages in that Year.	Conceptions in that Year.
20 Sections of 2 Years each ..	3,881,478	1,540,627	5,517,975
13 Sections of 3 Years each ..	2,559,635	975,773	3,556,842
10 Sections of 4 Years each ..	1,977,755	759,121	2,767,650
Totals of the 43 Sections	8,418,868	3,275,521	11,842,467
Mean annual Numbers ..	195,787	76,175	275,406

TABLE CI.—(*continued.*)

MORTAL YEARS.			
Divisions.	Healthiest Year of each Division.	Marriages in that Year.	Conceptions in that Year.
20 Sections of 2 Years each ..	3,774,732	1,561,935	5,471,930
13 Sections of 3 Years each ..	2,415,994	1,011,181	3,540,120
10 Sections of 4 Years each ..	1,858,000	791,150	2,758,594
Totals of the 43 Sections	8,048,726	3,374,266	11,770,644
Mean annual Numbers ..	187,180	78,471	273,736

(15) Thus, in each of the terms into which the preceding table has been divided, in the most mortal years of the sections, the marriages have been fewer, and still the conceptions more numerous, than in the healthy years; rendering it unnecessary to proceed to mention the circumstances which render the real prolificness of the standing marriages of the former years still greater on a comparison with those of the latter, than can appear by this mode of computation.

(16) Since constructing the preceding tables, however, I have observed in the preliminary observations in the second volume of the censuses, namely, that of 1811, a series of proportionate additions made to the registers of the baptisms, burials, and marriages since the commencement of the seventeenth century, terminating, however, with the year 1800. It is not assumed that these are any thing more than mere approximations towards a greater degree of correctness, nor am I satisfied that, relatively speaking, they are so in reality. But terminating as they do, with the year 1800, to the burials of which an addition of 6935 is made, and

none whatever to the year ensuing, the classification, as it regards those two years, must be reversed; throwing the latter year, which, being that in which peace was made, was so much more fruitful than the preceding one, into the opposite scale of the argument. The difference in this instance is 36,808; which sum, being reversed in position, is of course doubled in effect: and again, the slight difference of 60 between the mortality of 1818 and 1819, happens also to give more than ten thousand conceptions to the same side. I might indeed reject these arbitrary alterations made up to a certain date in the actual returns; and with still greater propriety omit the year 1801, as that of returning peace: but having, in the construction of every preceding table, avoided availing myself of any exceptions whatever, however proper, and indeed necessary, they might have been made to appear, for reasons already stated; I shall therefore insert another table, constructed upon the registers, as now altered according to the rectifications in the preliminary observations already alluded to; first giving the amount of the annual registers as thus increased, in each of the first twenty-one years of the forty, which the whole comprehends. To the remaining nineteen years no additions seem to have been made; respecting them, therefore, I need only refer the reader to the preceding Table.

TABLE CII.

SHEWING THE DEATHS, MARRIAGES, AND CONCEPTIONS IN ENGLAND AND WALES, FROM THE YEAR 1780 TO 1800 INCLUSIVE, WITH THE INCREMENTS ADDED TO EACH YEAR, AS SUGGESTED IN THE PRELIMINARY OBSERVATIONS PREFIXED TO THE CENSUS OF 1811.

Years.	Deaths.	Marriages.	Conceptions.
1780	198,348	64,309	231,127
1	195,902	63,768	224,835
2	187,152	63,071	221,285
3	188,264	66,287	229,669
4	194,401	68,935	244,642
5	191,866	71,549	242,677
6	185,232	68,992	245,080
7	184,881	76,448	250,681
8	187,598	70,032	250,595
9	185,570	70,696	256,548
1790	184,894	70,648	255,508
1	186,674	72,590	269,426
2	188,906	74,919	264,028
3	203,653	72,880	256,811
4	197,740	71,797	254,944
5	210,339	68,839	256,781
6	190,897	73,107	268,088
7	191,306	74,997	270,585
8	187,531	79,477	266,769
9	189,586	77,557	254,870
1800	208,063	69,851	237,029

(17) The following table exhibits the results of computations founded on the last table, and the one immediately preceding it. I have, in forming it, commenced the divisions of the entire term with the years 1780 and 1781 alternately; thus removing still further the possibility that the proofs, which both methods equally afford to the principle under consideration, can be the effect of either accident or management. By so doing, however, in the second biennial division, one year, namely, the last, is necessarily omitted.

TABLE CIII.

SHEWING, FROM THE PUBLISHED AND CORRECTED REGISTERS OF ENGLAND, FOR THE LAST 40 YEARS, DIVIDED INTO SECTIONS OF 2, 3, 4, AND 5 YEARS EACH, AND DIFFERENTLY DATED, THAT IN THE MOST MORTAL YEARS, MARRIAGES ARE MOST FRUITFUL OF CONCEPTIONS.

Divisions.	Dates.	Deaths in the most fatal Years.	Marriages in those Years.	Conceptions in those Years.	Deaths in the healthiest Years.	Marriages in those Years.	Conceptions in those Years.	Excess of Marriages, in the healthiest Years.	Conceptions to 1000 Marriages, in the mortal Years.	Conceptions to 1000 Marriages, in the healthiest Years.
20 Sections of 2 Years each	1780 to 1819	3,949,618	1,559,470	5,558,213	3,841,023	1,576,963	5,590,659	17,493	3564	3545
19 Sections of 2 Years each	1781 to 1818	3,774,553	1,475,140	5,302,257	3,604,176	1,501,413	5,271,828	27,535	3662	3511
13 Sections of 3 Years each	1780 to 1818	2,605,936	987,719	3,603,580	2,459,351	1,021,943	3,593,334	34,224	3648	3516
13 Sections of 3 Years each	1781 to 1819	2,593,930	1,021,762	3,642,884	2,454,058	1,028,721	3,614,376	6,959	3565	3513
10 Sections of 4 Years each	1780 to 1819	2,014,117	770,939	2,769,645	1,888,719	799,180	2,796,724	28,241	3592	3499
10 Sections of 4 Years each	1781 to 1820	2,028,484	768,455	2,782,224	1,872,061	786,558	2,798,604	18,103	3621	3558
8 Sections of 5 Years each	1780 to 1819	1,634,840	606,923	2,162,532	1,490,760	638,772	2,227,378	31,849	3563	3487
8 Sections of 5 Years each	1781 to 1820	1,634,547	609,771	2,226,126	1,496,613	630,172	2,250,846	20,401	3657	3572

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(18) Thus it is that the annual registers of this country, however examined, and notwithstanding the accidental difficulties with which the argument, as pursued in the last instances, has to labour, demonstrates that the prolificness of human beings varies inversely as their numbers, and enlarges even with those slighter decrements in the population which are of perpetual occurrence. Happily indeed for this country, the ratio of mortality varies but slightly; but still it appears most clearly, from the preceding table, that simultaneous with its augmentation, is an increase in the proportion of births to marriages. This is equally the case, whether the registers are divided into two, three, four, or five sections, of equal duration; and even though the divisions are made to commence at different dates. This fully appears by the two last columns of the preceding table, where the prolificness of the most mortal and healthiest years are respectively given; and I trust I need not again go over the reasons why the apparent difference in that prolificness, so calculated, is far less than the real one.

(19) The movements of the population in France are now annually published, but the practice has been too recent to enable us to found any very decisive proofs upon them. As far as they go, however, they decidedly corroborate the general argument of this chapter. From the year 1817 to 1827, we have the conceptions, as well as the deaths, of ten consecutive years. Dividing this term into two equal sections of four years each, and selecting from each section the most mortal and most healthful year, the following are the facts which they present:—

Table CIV.

Shewing, from the Registers of France during ten Years, divided into two Sections of five Years each, that in the most Mortal Years Marriages are the most fruitful of Conceptions[1].

Mortal Years.	Deaths.	Marriages.	Conceptions.	Healthful Years.	Deaths.	Marriages.	Conceptions.
1819	788,055	215,088	892,584	1817	748,223	205,244	855,304
1826	835,658	247,194	909,428	1823	742,735	262,020	912,978
Total.	1,623,713	462,282	1,802,012	Total.	1,490,958	467,264	1,768,282

So that in the two most fatal years, compared with the two healthiest ones, there were 132,755 more deaths, 4982 fewer marriages, and, nevertheless, 33,730 more conceptions.

(20) I shall conclude this branch of the argument by noticing the only objection that can be urged against the uniform results the foregoing tables present; and I shall give it in the words of Dr. Short, for the two-fold purpose of shewing that the fact contended for was fully apparent to him, and of pointing out how exceedingly erroneous is the reason, which however is still the current one, by which he attempts to account for it. He says, " In general, the next year " after sickly or mortal ones, is prolific in proportion " to the breeders left:" and again, " mortal years are " often succeeded by very fruitful ones[2];" of which fact he gives many instances, and truly develops, as I think, the final cause for such a surprising provision,

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[1] Annuaire, Bureau des Longitudes. A. D. 1830, pp. 94, 95.

[2] Short, New Observations, pp. 90 and 191.

"as though Nature," says he, "sought either to prevent, or quickly repair the loss by death[1]." But the physical one he assigns is singularly incoherent. "Many," he adds, "of the weak, sickly, declining constitutions being cut off, health returning gives vigour and vivacity to the survivors[2]." First, then, he has entirely overlooked that this increased prolificness is, in effect, taking place, cotemporaneously with the mortality, and consequently before this returning health has restored vigour to the remainder. Second, the weak and ailing parents, instead of giving fewer, frequently give more births than their proportion to the registers; a circumstance which neither physicians nor philosophers have overlooked: but supposing, contrary to the fact, that such parents produced no progeny whatever, that their removal should give additional fertility to the remaining marriages, which, moreover, have never in such seasons their usual quota of annual recruits, is a supposition that cannot be held for a single moment.

(21) Coupling with the preceding calculations what has been advanced in Chapters XII. and XIII. of the foregoing book, it may be hoped that the assertion that deaths make room for marriages, and that seasons of mortality are those of sterility, will no longer be repeated. The contrary is, in both instances, the undoubted fact. In what point of view, therefore, does the knowledge of this important truth place the theory which invests Nature with an excess of prolificness, that can only be regulated by those unnatural restraints which are denominated the preventive, or those cruel expedients which are called the positive checks? According to that supposition, these sweeping mortalities are necessary to repress the superfluous numbers of man-

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[1] Short, New Observations, p. 90 and 194.

[2] Ibid., p. 191.

kind, which its advocates contend the unrestrained laws of Nature are perpetually producing, and still they must be compelled to acknowledge a principle in existence directly counteracting what they hold to be the remedy for a redundant population, the moment that remedy is put into operation. The condition of man, therefore, according to that system, is not only wretched, but remediless. Such is the Manichean principle upon which modern philosophers conceive Nature to be regulated.

CHAPTER XXI.

OF THE LAW OF POPULATION; AS PROVED AND ILLUSTRATED BY THE ESTABLISHED PRINCIPLES OF HUMAN PHYSIOLOGY.

(1) HAVING proved, by an uninterrupted series of authentic facts, that the prolificness of human beings is regulated by the space they occupy, under such further modifications as have a direct tendency to proportion their numbers to their means of subsistence; and having shewn, that the very objections to this law of Nature, when duly considered, place it in a still stronger light, and render it the more irresistible, it may, perhaps, be judged, that the argument ought here to conclude. Such a principle as this, granting its truth, requires no comment to point out either its nature or its effects. It dissipates, at once and for ever, those fears regarding the future condition of mankind, so degrading in themselves, and so pernicious in their consequences: it demolishes all those "refuges of lies," in which cruelty and selfishness are at present so strongly entrenched, and establishes itself on the broad foundations of immutable benevolence and truth. It is surely, therefore, unncessary, were it possible, to point out, by way of enforcing the argument, those secondary causes, by which the purposes of Divine beneficence are accomplished: some of these we may think more or less apparent, but still the master mystery will for ever remain impenetrably hid in the breast of the Eternal. Reproduction, in all its infinite variety of forms, whether in the animal or vegetable

kingdom, and in the minutest instance, it has been before observed, is one of those mysteries of Nature which it is not reserved for human apprehension to fathom: a miracle to which nothing but the constant evidence of our senses could compel our belief; and, what if all the laws connected with it partake of the character of the principle, and should remain incomprehensible,—are we, therefore, to reject the facts which in evidencing its existence, manifest the mode of its operation? If we confine our consideration to those laws and influences of Nature which we imagine may be fully comprehended by us, our knowledge will indeed be limited, and our inductive philosophy worthless. As it respects the principle unfolded in this work, if it be founded on a series of indisputable facts, is it to be doubted, because we cannot clearly trace and comprehend that complicated train of secondary causes by which its purposes are finally accomplished?

(2) I conceive, nevertheless, that the law of population, however occult as to its primary causes, is, in the mode by which it effects its purposes, capable of further illustration, if not proof, by an appeal to those physical principles which have been detected as existing in human nature ever since the subject before us has excited attention; and which, moreover, are found confirmed by all the analogies of the animal and vegetable kingdoms.

(3) I therefore proceed to prove, that the law of human increase, as stated in this work, is one in perfect unison with, or rather required by the principles of physiology. I am aware that, in so doing, I am descending from demonstration founded upon facts, to arguments resting upon doctrines which, however generally held, may be rendered the subject of debate,

by dexterous opponents who may strive to obscure, or, at all events, to withdraw attention from those proofs, which are, in their very nature, indisputable. Such, however, I would remind, that though the argument now entered upon, if successfully pursued, will afford an additional confirmation of the main principle advanced, still, if it fail, it will not in the least affect its truth, any more than, were the theory of the tides, as explained by Newton, to be overturned, would the regular fluctuations of the ocean cease to be a principle of Nature.

(4) In pursuing this part of my subject, I must begin by reminding the reader of the difference between those who hold the superfecundity of mankind, and myself, in regard to those principles which will form the basis of the present argument. They contend, that production precedes population; I, on the contrary, maintain that population precedes, and is, indeed, the cause of production. They teach, that man breeds up to the capital, or in proportion to the abundance of the food, he possesses; I assert that he is comparatively sterile when he is wealthy, and that he breeds in proportion to his poverty: not meaning, however, by that poverty, a state of privation approaching to actual starvation, any more than, I suppose, they would contend, that extreme and culpable excess is the grand patron of population. In a word, they hold that a state of ease and affluence is the great promoter of prolificness: I maintain that a considerable degree of labour, and even privation, is a more efficient cause of an increased degree of human fecundity. I presume that, in advocating our respective opinions, we equally extend our views, as to their effects, from individual, to general and national results.

(5) Our views respecting the principle of population, physically considered, being thus adverse; in our deductions from it, we are still in direct opposition, and, consequently, both consistent. Those whose theory I have been controverting, assert, most confidently, that that principle would, if unrepressed by what they denominate "checks," lead, infallibly, to universal degradation and suffering: I, on the contrary, argue, that the same principle, without any limitations as to its effects, but those the Deity has himself ordained, would conduct mankind, by a regular and sure progression of increasing improvements, moral, intellectual, and physical, to the highest state of human happiness and prosperity; that the increase of human beings creates, and continues in ceaseless operation, that necessity which is the great moral lever, if I may so speak, by which the condition of the species is perpetually elevated.

(6) Let us bear in mind these opposite views, while we advert to the condition of human beings in the various states into which they are usually classed, or through which those communities have passed which have emerged from barbarism, and gradually risen, as their numbers have enlarged, to the present summit of civilization: we shall then be enabled to determine, more confidently, which of these opposite theories it is that is contradicted, and which illustrated and confirmed by the acknowledged principles of physiology.

(7) I shall contract one part of the subject, interesting as it is, as much as possible; having already discussed it somewhat at large in a preceding book of this treatise, when speaking of the precedence of population to food, and the beneficial effects of that necessity, which is thereby constantly brought into operation. It may suffice, on this occasion, to remind

the reader of some of the principal gradations in the state and condition of human beings there pointed out, and to shew the necessary connexion, as I contend, between them, and the principle of human increase.

(8) The first and lowest condition in which human beings are presented to our contemplation, is that in which they are mere hunters, or, little more than superior animals of prey; a state of extreme severity, whether it respects the fatigue, or the privations it implies. It demands, moreover, a vast extent of country, in proportion to the inhabitants, to render such pursuits available for the purpose of sustaining life; and, therefore, as they multiply, a more ample and certain supply of those animals on which they subsist becomes necessary, and the nomadic or pastoral must therefore succeed to the predatory condition. Numbers still increase, and the agricultural state necessarily ensues, being the simplest form of civilized society; that which obviously supposes the scantiest population, and unquestionably the most laborious, not to say necessitous habits, of any with which we are in these days personally conversant, though greatly superior, in all respects, to the preceding conditions. Population still enlarges; and while all classes partake of the general benefit, multitudes are liberated from the lower drudgeries of life; many are found devoting themselves to higher and more intellectual pursuits; and not a few exist in a state of the most luxurious refinement.

(9) Such has, in many respects, been the history of almost every country upon earth; nor could a community, originally barbarous, and increasing in numbers, continue to subsist, much less attain to a high state of civilization, in any other course. Two facts,

essential to the argument, present themselves to our consideration in this progression of society: the first is, that, at every step of it, the means of subsistence become more certain in their supply, more sufficient in quantity, and, above all, greatly improved in their kind. The second, that human labour is, at the same time, as regularly diminished in its duration, and mitigated in its intensity. In short, increase of population is, in every properly regulated community, the cause of diffusing greater ease and enjoyment, and of dispensing greater plenty; and the ancient maxim, that people are the riches of a country, is, in every sense of the expression, fully confirmed.

(10) The question now arises, which state is it that is most favourable to human prolificness?—that where the population is the most thinly scattered, and consequently where there is the most labour, and the greatest frugality; or that where it is large and densely planted, and where, therefore, labour is on the whole lessened and mitigated, and the comforts, not to say luxuries, of life are more generally enjoyed? The former, most undoubtedly. Whether we trace the history of the question in one and the same country, in the course of its progress, or compare existing communities, differing from each other in these respects, as has already been done, this is equally the fact; and I now proceed to shew, that it is one which is perfectly consistent with, or rather, indeed, demanded by, the universally acknowledged principles of human physiology.

(11) But, regarding the first stages of society alluded to, namely, the uncivilized, it must be confessed too little is accurately known, in relation to the subject before us, to warrant any precise and confident conclusions. I am fully aware, indeed, of the

common opinion, that such a state is eminently unprolific; that it may be actually so, is perfectly consistent with the preceding views of the subject; and if such is the case, it is doubtless attributable to those ecbolic practices[1], those infanticides , and other pernicious and unnatural habits[3], which they are represented as having unhappily adopted with the express intent of checking their increase. Admitting these accounts to be true, or even partially so, no further evidence is necessary to prove the extreme degree of natural prolificness in such a state, as nothing else could have continued such races in existence while adopting habits and customs which would, beyond a dispute, speedily cause the extinction of any civilized community upon earth. Where these infamous usages have been abolished, which has lately been happily the case in certain instances, we hear of the large families and growing numbers of the inhabitants[4], and their rapid advances to civilization and happiness. Ancient history also fully confirms the fact of the high degree of prolificness of this condition of life, when the feelings and duties of human nature are not outraged by "the checks to population." Tacitus informs us of the ancient Germans, who were, in other respects, in a very similar state with these modern savages, that "to "restrain the generation and increase of children was "esteemed by them an abominable sin," and also to kill infants[5]; and Cæsar tells us that wine was forbidden, because they supposed it to obstruct the fecundity of the women[1];—a proof that our untutored ancestors were full as accurately acquainted with the principle of human prolificness as those who descant upon breeding up to capital. These, and a variety of similar notices, convince us that human increase was unrestrained among them; and the fact of their prolificness being exceedingly great, we may safely leave to be asserted by those who have built so much upon their extraordinary multiplication in proof of the superfecundity of the human race. In fact, their "*officina gentium*," and "*vagina nationum*," were the forests of Northern Europe, inhabited by a race of barbarian hunters, no way distinguishable from those who exist at present in that condition, only that they held in abhorrence any restraint upon their natural prolificness: hence their growing posterity have possessed themselves of the fairest, and given institutions to the finest, regions of the world; while those who have unhappily been practical converts to the necessity of repressing their numbers, daily becoming more degraded in their condition, and depraved in their habits, are disappearing fast from off the face of the earth.

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[1] Robertson, History of America, b. iv., p. 72. Burke's America, vol. i., p. 187.

[2] William Ellis, Narrative of a Tour through Hawaii, pp. 324, 325, 326, 328, 329. Cook's Voyages, 2d Voyage, vol. i., p. 352. Humboldt, Personal Narrative, vol. v., p. 29, &c. Malte-Brun, Géog., l. xxxvi., p. 637.

[3] Bossu, Louisiana, vol. i., p. 105. Dr. Black, Observations, Medical and Political, p. 139. Kalm, Travels in North America, vol. iii., pp. 303, 307. Long, Voyages, &c., in America, pp. 137, 138. Charlevoix, N. France, t. iv., p. 304. Robertson, History of America, b. iv., p. 107. Cook's Voyages, *passim*. Herriot, Travels through Canada, p. 344.

[4] See Ellis's Narrative, *passim*.

[5] Tacitus, De Moribus Germanorum, xix., 45.

(12) Farther than this, in proof of the prolificness of the most scantily peopled districts, whose inhabitants still are in an uncivilized state, we cannot at present go; nor does it appear necessary to attempt to add to the facts already advanced. One of these original classes of society, however, still exists in civilized countries,—I mean fishermen; their pursuits are still identical, in some respects, with those to whom we have been adverting; and these are found to be highly prolific

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[1] Cæsar, Comm., l. iv., c. 2.

every where, compared with the rest of the community[1]; and, as I contend, because they are subject, generally speaking, to greater hardships and privations[2].

(13) Directing our attention to the different classes of society in a state of civilization, the agricultural is that which first presents itself to our notice, as unquestionably requiring the largest extent of space, and imposing the greatest labour and parsimony of living. I allude not to those superior cultivators whom the large farming system has unhappily brought into existence, and who are, and must be, too few in number to influence the question; but to that immensely numerous class who still labour the soil personally, whose condition, under ordinary circumstances, is hard; I fear I might add often wretched, compared with the artizans of the community. The latter, as society advances, become proportionably more numerous; their labour is lessened by its minute division, and still more by the mechanical arts which greatly diminish its intensity, while its relative remuneration is at the same time, generally speaking, augmented. Higher pursuits supervene, property is accumulated, and multitudes are liberated from the necessity of personal exertion altogether; while almost all gratify, in some degree, those propensities which are natural to human beings; not meaning their criminal ones, but rather an indulgence in ease and luxury, to the full extent of their means and opportunities. The latter condition of society, I must repeat, supposes a fuller population; and it is one which is invariably found, as we have shewn

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[1] Dr. Clark, Travels in Scandinavia, p. 528. Dr. Virey, Dict. des Sciences Médicales, Art., Fécondité.

[2] "La profonde misère dans laquelle est plongée en général la classe des pêcheurs."—M. Benoiston de Chateauneuf, Bul. Universel, de Géog., &c., l. ix, p. 11.

through the whole of the preceding tables, to be less prolific. This is the undeniable fact, and it is one which physiology has not left unexpounded.

(14) Hippocrates, doubtless one of the most accurate and attentive observers of Nature amongst a profession so peculiarly qualified to decide upon this point, did not leave unnoticed the fact, that the labour and privation of the lowest sphere of life was as favourable to prolificness, as the indolence and affluence of the highest was adverse to it. His authority will abundantly confirm both parts of the argument. Speaking of the Scythians, amongst whom, he says, barrenness prevailed, he observes, that that misfortune did not affect the poor, but the rich, amongst the people; the most noble, and those that had large estates. He attributes, indeed, the want of fruitfulness to several causes, but especially to a sedentary life; indulgence in riding in carriages; muscular laxity, or weakness, in the female sex, &c.; and comes to this conclusion, πολύγονον δὲ οὐχ οἷόν τε εἶναι φύσιν τοιαύτην[1]. Again, he draws a comparison between the prolificness of the females of the highest and lowest condition of life in the same country, and observes of the former, that they are unfruitful, from want of exercise, and profuseness of living, at least from its general consequence, fatness; deducing, from these very circumstances, their sterility. But of the laborious class among them, their slaves or servants, he says, that though they are not most prone to sexual intercourse (quæ cum virorum congressum non appetant), yet that they become pregnant, from their exercise and spare habit of body[1]. Delivering forth in few words, what,

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[1] Hippocrates, De Aëre, Locis, et Aquis, § iii., p. 292., l. 48. Foësius, Genev., fol. 1657.

[1] τῇσι δὲ γυναιξὶν, ὅτι πιότης τῆς σαρκὸς καὶ ὑγρότης, αὐταί τε ἀταλαίπωροι καὶ πιμελαὶ καὶ αἱ κοιλίαι ψυχραὶ καὶ μαλακαὶ, καὶ ὑπὸ τουτέων τῶν ἀναγκαίων οὐ πολύγονόν ἐστι τὸ γένος τὸ Σκυθικὸν, μέγα δὲ τεκμήριον

it will be seen, subsequent authorities have asserted; and all that, I verily believe, is known to this day upon this subject: at all events confirming, to the very letter, the argument now advanced in favour of the law of population as founded on physiology. Such, then, is the judgment of the father of medical science on this important point. Nor has the father of profane history left unrecorded the same fact, namely, that the poor man is distinguished as being "blessed with children[1]." Aristotle also has said that the condition most favourable to procreation, is "a habit of body inured to labour[2]."

(15) It is unnecessary to appeal to the Latin writers on this subject; that the poor and laborious part of the Roman people was the prolific portion of the population, needs no further proof than the very name by which that class was distinguished among them,—Proletarii[3].

(16) At the head of all modern authorities, there can be no hesitation whom we have to place. The unanimous suffrages of succeeding ages assign that rank to Bacon. Did this great philosopher suppose that mankind breed up to food? On the contrary, he asserts, in language as unequivocal as the truth he announces is indisputable, that REPLETION IS AN ENEMY to GENERATION[4]; and, in so expressing himself, he left nothing to be unfolded in regard of the principle at issue, except an amplification of those

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αἱ οἰκετίδες κυΐσκουσι· οὐ γὰρ φθάνουσι παρὰ ἄνδρα ἀφικνεύμεναι, καὶ ἐν γαστρὶ ἴσχουσι διὰ τὴν ταλαιπωρίην καὶ ἰσχνότητα τῆς σαρκός· Ibid., l. 53., et. suc.

[1] Herodotus, Clio, § 32.

[2] Arist. Op. de Repub., l. vii., c. xvi., p. 446. E.

[3] Kennett, Roman Antiquities, p. 131.

[4] Bacon, Centuries, V. § 428. It is true Lord Bacon applies the aphorism quoted above to the vegetable kingdom; but, that he held it especially true in reference to animal and human physiology, there is not the slightest doubt. Witness the reason he gives for the superiority of the Spartan women as breeders, which is not the usual one; it was, says he, to be "imputed to their parsimony of diet." Hist. of Life and Death, § 32.

proofs, whether from the vegetable or animal kingdoms, from which he had deduced this incontrovertible physical axiom.

(17) In confirmation of this doctrine, if it need confirmation, I think every writer, and especially every medical one, who has touched upon the subject, might be adduced. I shall, however, confine myself to a few; and first I shall quote Dr. Short, who to his professional knowledge and experience added the information derived from a body of statistical facts collected with great and persevering industry, and from almost every quarter. He asserts, over and over again, and throughout his whole work, that poor food[1] and hard labour[2] are conducive to prolificness, and consequently that "the poorest and most laborious part of mankind," to use his own words, "are the fruitfullest[3]." He even carries this idea so far as to conclude that the most laborious and toilsome months of the year are the most fruitful of conceptions[4], and attributes the great prolificness of the Israelites in Egypt, as a secondary cause, to their bondage and affliction[5]. He explains the inferior fecundity of town breeders compared with those of the country as arising, among other things, from the more plentiful eating and drinking, and the greater idleness, which prevail in populous towns[6]; observing, that the most voluptuous, idle, effeminate, and luxurious, are the barrenest[7]; and he delivers what I believe to be an incontrovertible axiom, that though "idleness may be a friend to venery, it is not so to prolificness[8]." In a word, this patient and accurate observer confirms, in every part of

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[1] Dr. Short, New Observations, &c., p. 145.

[2] Ibid., pp. 144, 263.

[3] Ibid., p. 144.

[4] Ibid., p. 143.

[5] Ibid., p. 263.

[6] Ibid., p. 121.

[7] Ibid., p. 143.

[8] Ibid., p. 143.

his work, the physiological argument in favour of the law of population, as now advanced.

(18) In precise conformity with the opinion of Dr. Short, is that of Dr. Black, another well-known writer upon medical statistics. The latter, indeed, studiously shuns any deep discussion of causes, but unhesitatingly declares that "high refinement is an obstacle to propagation[1];" and this state is not supposable in any other than an increasing stage of population, with which, indeed, he connects it when so expressing himself[2].

(19) Indeed, so received an opinion has it been in the medical profession that a state of poverty is favourable to procreation, that the regimen prescribed in cases of barrenness occurring in the higher ranks, has been to reduce those so affected, in point of diet and exercise, to the harder condition of the lower ranks, among whom that case so rarely occurs. Such was the course indicated by the celebrated Cheyne; but, to refer, lastly, to a book in every one's hands, in preference to more rare and recondite authorities, that of Dr. Buchan, whose opinions are founded, in this instance, upon common sense and universal experience, whatever may be his professional character with the faculty. He remarks that "a barren woman is seldom "found among the labouring poor[2]," and adds; "would "the rich use the same sort of food and exercise as "the better sort of peasants, they would seldom have "cause to envy their poor vassals and dependants the "blessing of a numerous and healthy offspring, while "they pine in sorrow for the want even of a single "heir to their extensive domains[3]." He further ob-

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[1] Dr. Black, Observations Medical and Political, p. 110.

The same observation occurs in a judicious pamphlet with which, since writing the above, I have been favoured by the author, S. Read, Esq.

[2] Dr. Buchan, Domestic Med., p. 501.

[3] Ibid., p. 501.

serves, as the cause of this comparative barrenness amongst the wealthy, that “ affluence begets indolence, “ which not only vitiates the humours, but induces a “ general relaxation of the solids; a state highly unfavourable to procreation[1].” He properly attributes “ the great increase in infant colonies” to the daily labour to which the inhabitants are obliged to have recourse[2]; and asserts, in different language, a fact which Dr. Short had before maintained[3], and with which I shall sum up the medical authorities on this subject, that “ the inhabitants of every country are prolific in proportion to their poverty[4].”

(20) Having commenced these appeals with the authority of the father of medical science, I cannot refrain from concluding them by quoting one of the latest and most judicious of his sons, Dr. Gregory, who fully confirms all that has been advanced upon it, which I shall give in his own language in the notes[5].

(21) Nor is this fact confined to medical observation only; almost every writer who has alluded to the subject, has asserted the same thing. Dr. Adam Smith observes that “poverty is favourable to generation,” and contrasts the extraordinary prolificness of the half-starved Highland woman with the sterility of the fine lady; and adds, that barrenness, so frequent amongst women of fashion, is very rare among those in inferior station. “ Luxury,” he remarks, “ while it

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[1] Dr. Buchan, Domestic Medicine, p. 501.

[2] Ibid., p. 76.

[3] Dr. Short, New Observations, p. 144.

[4] Dr. Buchan, Domestic Medicine, p. 501.

[5] “ Ignavia et luxus omnes homines “ vel steriles paulatim reddunt, vel prolem producunt debilem atque morbosam, qualis infantiam ægre superaverit, et raro virilem ætatem attigerit. “ Sic rustici fere omnes fœcundi sanæ “ et vegetæ prolis; urbani vero, sæpe “ vel steriles, vel miserandæ progeniei “ parentes. Solum quidem rus ferax hominum, quos non sibi soli educat, sed “ urbibus quoque, quæ aliter brevi inanes “ forent: rara enim exempla familiarum “ artificum quæ per quatuor generationes floruerunt. Quin et nobilissimæ “ et antiquissimæ gentes optimatum et “ principum indies minuuntur, et pereunt.” — Gregory, Conspect. Med. Theoret., c. xxi., § 830.

" inflames, perhaps, the passion for enjoyment, seems " always to weaken, and frequently to destroy altogether, the powers of generation[1]." Rousseau has the same idea, which he expresses in similar terms when he speaks of " the sterility of the fine ladies" in crowded resorts, and contrasts it with the natural prolificness of the sex in distant country parts, of course thinly inhabited, and where, as he observes, " greater simplicity prevails[2]."

(22) Finally, though I do not contend that difference in local situation has no influence on human prolificness, still I maintain that poverty as such, with its necessary labour and privations, is, in the same situation, whether it be city or country, more prolific than wealth, which is exempt from them. In proof of this, Dr. Perceval, one of the most judicious writers on population, says that "the parish of Dunmow, in Essex, " contained 262 poor families, who had 460 children; " there were also 116 families of the ranks above them, " who had only 120 children: little more than half the " former proportion. The ratio of deaths in five years " was, of the poor children, 1 in 45½; of those in a " higher station, 1 in 37½[3]." I shall omit other proofs of the same facts, in favour of the statement of M. Villermi, who, in his late researches concerning the population of Paris, has remarked that, comparing the first and the twelfth arrondissements, the former of which is the richest, and the latter, the poorest, division of the city; the poorest is the more fruitful, in the proportion of 1 birth in every 26 of the inhabitants, compared with 1 in every 32; a difference of nearly one quarter[4]. A similar fact might easily be shewn

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[1] Dr. Adam Smith, Wealth of Nations, vol. ii, p. 379.

[2] Rousseau on Educ., vol. ii., p. 184.

[3] Dr. Perceval, Essays, &c., vol. ii., p. 379.

[4] Villermi, Recherches Statistiques sur la Ville de Paris. Appendix to Report on Friendly Societies, p. 167. (1825.)

to exist as to the comparative prolificness of different parts of our own metropolis. M. Villermi comes to an opposite conclusion as to the proportion of mortality amongst the offspring of each class, but he has left out of the computation the great numbers of the children of the poor who are received into charitable institutions, and who, consequently, diminish the number of the families on which the proportion he gives is calculated. Dr. Short, whose view of the subject was much more extensive, asserts, on the contrary, that the offspring of the labouring poor are more vigorous and healthy; and when it is recollected that a far greater proportion of wealth is concentrated in towns than in country places, the fact of so much higher a mortality amongst the children in the former than in the latter situation, seems to decide the question, as to which class it is that not only produces, but permanently adds most to, the population of any country.

(23) The preceding view of the principle at issue is susceptible of a more general demonstration: it is proved by the universal history of the human species. How and when was it, that the different communities, which have successively become mighty nations, and have possessed themselves of the power and opulence of the world, multiplied their numbers and spread their dominion? While they were, of necessity, temperate, frugal, and industrious, and consequently prolific and increasing. What was it that, in almost every single instance, wrought the downfall of such countries? Superfecundity, and its concomitants? Excess of numbers and want of food? Alas, for the supposition! Whether individually or nationally considered, it is one of the grossest fallacies ever palmed upon the human understanding! It was excess of wealth; it was ease, and luxury, and refinement, that

prepared the catastrophe of every country destined to destruction: a state which so diminished the prolificness of all such communities, that no examples, however elevated; no laws, however severe; no efforts, however strenuous, could replenish their decreasing numbers; and "they fell," to avail myself of the language of Raleigh, in his History of the World, "by that excessive luxury, wherewith all, or most of "empires that ever were, have been enervated[1]." Their history furnishes us with so many fatal proofs, that the principle I am opposing is not only anti-social in its nature, but patricidal in its effects. We may hope, however, that the religion of civilization, which inculcates doctrines so different, and leads to consequences so opposite, will be effectual to save the existing countries of Christendom from such a melancholy catastrophe.

(24) Thus is it, that the law of population, as confirmed and expounded by physiology, appears a principle of universal and unceasing benevolence: it is not only the cause of the present advancement of society, but will remain the impetus of its future and indefinite improvement. The moral argument in its favour, therefore, at least, equals in its weight the philosophical one; it, perhaps, might weaken both, in the account of some reasoners, were the authority of inspiration superadded. It is, nevertheless, a truth, however regarded, that the Supreme, either by the direct interference of his providence, or by the operation of secondary causes, "setteth the "poor on high from affliction, making them house-"holds, like a flock of sheep. He blesseth them, so "that they multiply greatly."

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[1] Raleigh, Hist. World, book iii., c. 6, § 11, p. 413.

CHAPTER XXII.

OF THE LAW OF POPULATION; AS PROVED AND ILLUSTRATED BY THE ANALOGIES OF ANIMAL AND VEGETABLE REPRODUCTION.

(1) I CANNOT close the subject of the last chapter without making, in behalf of the argument there pursued, a further appeal to analogy, which often leads us to important truths, even when there seems to be no other guide; and still more frequently gives its decisive confirmation to those, which might otherwise remain in doubt or obscurity. Fortunately, indeed, for the principle at issue, the proofs already adduced need little further support; but it is, nevertheless, pleasing and satisfactory to observe, that the laws of Nature, however varied in their operation, always illustrate each other, and proceed upon harmonious principles, in producing their general results. More particularly, the striking conformity that subsists between the processes of reproduction throughout the whole of animated, and, indeed, inanimate existence, suggests the propriety of extending the argument to the physiology of the animal and vegetable kingdoms, as far as regards the subject before us.

(2) It would be insulting the intelligence of the reader, to tell him that spare living and constant labour, in the animal creation, as effectually promote fecundity as pampered indolence is fatal to it. This is universally the case, as far as it is under human management; and it need not be added, that in a state of

nature, there is little to apprehend from the consequences of excess. There is not an agricultural breeder that is not well aware of this fact; the scientific or experimental ones, invariably, to their cost. Those specimens which, with much care and by repeated attempts, they have at length bred up to their ideal model of symmetry and perfection, and which they have to feed profusely to keep their beauties stationary, are invariably infertile, compared with others more hardly dealt with, and less carefully attended to.

(3) Though it is perfectly superfluous to contend for an undeniable fact, still I cannot refrain from giving the authority of an ancient and elegant agricultural writer on this point, and probably an early favourite with the reader, whatever may be his present pursuit; who has delivered the principle for which I contend, as an universal and perpetual truth, in language which will be as permanent. Virgil thus indicates the state of prolificness, as it respects the important domestic animal of which he is speaking; and it precisely conforms to all that has been advanced regarding the human female, in that respect.

> Ipsa autem macie tenuant armenta volentes;
> Atque, ubi concubitus primos jam nota voluptas
> Sollicitat, frondesque negant, et fontibus arcent:
> Sæpe etiam cursu quatiunt, et sole fatigant,
> Cum graviter tunsis gemit area frugibus, et quum
> Surgentem ad Zephyrum paleæ jactantur inanes.
> Hoc faciunt, nimio ne luxu obtusior usus
> Sit genitali arvo, et sulcos oblimet inertis;
> Sed rapiat sitiens Venerem, interiusque recondat.[1]

(4) Bacon, quoting, I think, from an ancient philosopher, says "*Homo est planta inversa;*" and the argument regarding the principle of human prolificness derives all the proof and illustration from the

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[1] Virgil, Georg., l. iii., 129—137.

physiology of the vegetable creation, which it is capable of receiving from such a source.

(5) Whether plants are prolific in proportion to the quantity of nourishment they receive, or, to transfer to the vegetable, the language which is applied to the animal, or rather human economy, "breed up to their food," needs little discussion. In a country which has long taken the lead in agricultural philosophy, the most ignorant cultivator it contains will instantly decide. All such are aware, that where the vegetable food is too profuse, either in consequence of over-manuring, or the too luxurious state of a soil just broken up from the rest of pasturage, and before it has been "vexed by repeated ploughs," and subdued by croppings, the cultivator runs the risk of his crop "running into straw;" when he would not have "seed again," to use the phraseology of his pursuit. In such cases, the most untutored hind translates Virgil as correctly as the profoundest scholar, where he says,

> —— Ah, nimium ne sit mihi fertilis illa,
> Neu se prævalidam primis ostendat aristis[1]!

(6) Nothing, therefore, can be more certain, than that the food of plants may be too rich and too profuse for the reproductive, though highly favourable to the vegetable, principle. In fact, the commonest operations in agriculture and horticulture are so far from confounding these two principles, that they clearly proceed upon the presumption that they are opposed to each other; as, for instance, the "spring feeding" of wheat, as it is called; that is, the turning of sheep into it to keep down its luxuriancy; the topping of beans; the pruning and terebration of fruit-trees, and many other similar practices, abundantly shew, that luxu-

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[1] Virgil, Georg., l. ii., 252, 253.

riance of leaf, strength of stem, and depth of colour, which arise from profuse stercoration, natural or artificial, and indicate the utmost possible degree of vegetable vigour, prognosticate, as certainly, a deficiency in the principle of prolificness; in a word, rankness is but another phrase for barrenness[1].

(7) These remarks want no confirmation. They are as old as the occupation of husbandry. The pupil of Aristotle, Theophrastus, observes, that barrenness happens to those plants that grow with the most vigour, or in other terms, that are most luxuriantly fed; and I copy from a most interesting work of the present day, a proof that the fact remains the same, and that the general principle for which I contend, and with which I shall conclude the present branch of my argument, is equally true respecting the vegetable, as it is of the animal kingdom.

(8) "In newly-enclosed carse-lands," says a contributor to the Quarterly Journal of Agriculture, "the "evil of excessive luxuriance is frequently expe"rienced, to an inconvenient degree, during two or "three years. The straw is great in quantity, but "the grain always deficient." But it is the following extract from the same article, to which, however, I would particularly allude. "When plants are "furnished with an abundant supply of food, their "reproductive energies develop themselves slowly, "and flowers and fruit are late in appearing. On the "other hand, when the supply of nourishment is "scanty, when the plant is, as it were, starved, and "when death is threatened, the reproductive energies "act with readiness, flowers and seeds are produced, "and the extinction of the race guarded against: "or, in other words, the scantier the supply of nou-

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[1] Du Hamel, Husbandry, p. 84.

" rishment, the earlier will a plant propagate its " kind."

(9) The preceding observations are equally applicable to all the vegetable tribes. Linnæus has dwelt much upon subjects which evidence the wisdom and resources of the Creator, in regard to the prolific energies of nature, and, as has been well observed by an able writer of the present age, Dr. Smith, " When " the roots of plants are luxuriantly prolific, the " flowers are in some measure defective; Nature relaxing, as it were, her usual solicitude, and allowing " her children to repose and indulge in the good " things about them. But when want threatens, she " instantly takes the alarm, and all her energies are " exerted to secure the future progeny[1]." The principle recognised in this view, is not only consistent with the philosophy of vegetable, but of animal life, as adopted throughout this treatise.

(10) So true is it, therefore, that in the vegetable, as well as in the animal kingdom, " repletion is an enemy to generation:" so false, that in either, and, above all, as it respects mankind, any existence whatsoever " breeds up to food."

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[1] Smith, Introd. to Physiological and Systematical Botany, 3d edit., p. 242.

CHAPTER XXIII.

OF THE LAW OF POPULATION; AS PROVED BY AN APPEAL TO THE REGISTERS OF DISTINCT CLASSES OF SOCIETY IN THIS AND OTHER COUNTRIES, AND ESPECIALLY TO THOSE OF THE BRITISH PEERAGE.

(1) THE true principle of human prolificness has now, I trust, been demonstrated by the statistical records of every country or community which has registered the facts necessary for its determination; and though this method of proof must, under every view of the question, remain infinitely the most important and conclusive, I have nevertheless not unfrequently heard those on whom it had made sufficient impression, express a wish that the argument could be invested with a degree of individuality which it cannot possess in any of its preceding forms; by selecting, for example, a certain number of individuals from the general community, and scrupulously recording all the circumstances relative to the question, which should attend them, during a period of time sufficiently extended to enable us to arrive at any safe and conclusive results. Such have imagined that the proofs thus obtained might gain in distinctness what they would unquestionably lose in comprehensiveness. This mode of proof, (and it is the only one which, as I conceive, remains untouched,) though far less conclusive than those already pursued, would nevertheless, as affording a further corroboration of them, be curious and interesting; did it not necessarily defer the result of the inquiry to be deduced long after those who had instituted it should have ceased to exist. It

has occurred to me, however, that we have the materials for an instant demonstration of this kind already accumulated, and of a far more authentic and comprehensive character than individual observation can ever hope to obtain. But, in order to judge of their appositeness and validity, let us once more call to mind the position controverted, and that attempted to be established, in this work.

(2) The fallacious principle of population, as I shall now venture to denominate it, teaches that human beings have a tendency to multiply far more rapidly than their means of subsistence, and, indeed, in such different ratios as would soon produce the former in numbers inconceivably greater than the latter could supply; food, therefore, is represented as limiting the actual increase, but not without the co-operation of incessant restraint, and much misery and distress, constantly resulting from this tendency to superfecundity. In the mean time human beings breed up "to the level of food[1]," or are prolific according to the cheapness of corn or the facility with which they can obtain it[2]: or, in the words of a third advocate of the theory, "population increases or diminishes with the increase or diminution of capital[3]:" or, as expressed elsewhere, "revenue is the source of population[4];" a fact, as it is supposed, of which statesmen have been unaccountably ignorant, and have consequently been betrayed into the most ridiculous and fatal errors. The true system, on the other hand, maintains exactly the reverse of all this; namely, that there is, in the natural progress of society, a tendency for food to increase faster than population; at least, to become more certain in its

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[1] Malthus, Essay on Population, *passim*.

[2] Ricardo, Principles of Polit. Econ., p. 68.

[3] Milne, Treatise on Assurances, &c., Population, vol. ii., p. 390.

[4] Malthus, Essay on Population, p. 477.

supply, more profuse in quantity, and superior in quality: but that this improvement acts inversely on the principle of increase, which renders human beings more prolific when they are coarsely and scantily, and, on the contrary, less so when they are profusely and luxuriously, fed. I need not recapitulate the argument which has proved the former state to be connected with a scanty, and the latter with a replenished, population, or again remark on the beneficence of such a principle, operating, as it does, as a perpetual remedy for the evils of society, without the possibility of itself ever becoming one of them.

(3) Now, supposing we could put these opposite principles to the test of experience in the existence of a certain given number of human beings, placed, according to the doctrine controverted throughout this work, in the most favourable condition for developing the utmost effect of the principle of human increase, what would be the desiderata in the first place regarding their state and condition, and, secondly, respecting the certainty of the facts to be recorded, which would render the demonstration indisputable and complete?

(4) It would be required that a certain limited number of individuals should be placed in circumstances, first, highly favourable to the preservation of their own existence; second, that they should be in possession of that affluence which should render what is called the prudential or preventive check totally inoperative, and that they should fully avail themselves of this immunity by being a marrying class; third, that the utmost degree of care should be devoted to the preservation of their offspring, who should in like manner succeed to the enjoyment of all the personal advantages which wealth can bestow.

Next, it would be necessary that the number constituting this class should be precisely known, that all accessions to, or exclusions from it, should be carefully recorded, and that the marriages, births, and deaths, occurring in it, should be as accurately registered. Lastly, a sufficient length of time ought to be allowed to intervene before the number of the descendants should be compared with that of the progenitors, and according as the latter should be found to have increased or diminished, would the assertion that human beings breed up to the level of their food, and in proportion to their affluence or capital, be finally confirmed or negatived.

(5) Precisely such a class have we in the peerage; only found under more favourable circumstances, and their numbers kept with greater certainty and distinctness than the most anxious statistical inquirer, bent on the demonstration of the principle in dispute, could have required or even imagined. Touching their number, this has been accurately known and recorded ever since the order has existed in the country. For several centuries past, the addition to it of a single individual has been a matter of public interest and notoriety: this hereditary honour, conferring not personal dignity merely, but important privileges, and being almost always identified with great wealth and influence. The records relating to it are kept with the most scrupulous attention, not only by heirs and expectants, but they are appealed to by more distant connexions, as conferring distinction on all who can claim such affinity. Hence there are few disputes concerning successions to this rank, but such as go back to very remote periods. In later times, the marriages, births, and deaths, of the nobility have not only been registered by and known to those personally interested, but have

been published periodically, and, consequently, subject to perpetual correction and revision; while many of the most powerful motives which can influence the human mind conspire to preserve these records from the slightest falsification. Compared with these, therefore, all other registers, or reports, whether of "sworn searchers" or others, are incorrectness itself. I shall mention here, by way of prolepsis, what will be hereafter proved, that this is a marrying order of society, nor, indeed, could it be imagined otherwise; the prudential check can evidently have no influence whatever, while, on the other hand, motives only less powerful than the impulses of nature, incite its members to perpetuate their honours and transmit their possessions to their posterity. I shall also forestall my answer to another probable objection, by denying that " vice," any more than " misery," or " moral restraint," is among the number of checks which influence the increase of this class; that vice, at least, which affects the constitution, and, therefore, alone concerns the principle at issue. Placed, then, in all respects in circumstances which the system opposed pronounces as the most conducive to human prolificness, does this class,—do the nobility—" breed up to the level of their food," and " double their numbers, in geometric progression," at short and stated intervals?

(6) The very question instantly suggests its reply. Common observation has familiarized the contrary fact too long and too fully to leave the least room for hesitation or doubt upon the subject. But though it is quite clear that this class has not for ages past reproduced its own numbers, still it is, perhaps, hardly known how very far it has fallen short of so doing, ever since it has been no longer liable to the dangers to which it was once peculiarly exposed. In pursuing

the inquiry, therefore, I shall not go too far back into our history; I shall not seek for a multitude of the male descendants of the great barons of the Conqueror, or of those registered as his distinguished adherents in the roll of Battle Abbey, who, had their increase taken place agreeably to what we are assured is the law of nature, would have amounted, unchecked, to more souls, not only than now exist in England, or upon earth, but infinitely exceeding the total number of all the sons of Adam that ever did exist, through the long succession of ages since the foundation of the world. I shall, however, just inquire where are the individual representatives of these persons? Few, indeed, are to be found who make such pretensions, notwithstanding the yearnings of many to have their line traced to antiquity and notoriety, and notwithstanding the ingenious assistance of antiquaries and heralds, who have not always, it is thought, been too scrupulous in administering gratification to such aspirants. The learned Vestergan, who lived upwards of two hundred years nearer the conquest, has not left the fact of this great diminution unnoticed. He supposes, indeed, that "the issues of some of them might now and then end in monasteries;" (few male heirs, however, thus extinguished themselves;) "some go to Normandy;" (fewer still, it may be concluded,—the court, whose favour they monopolized, and which was the scene of their ample reward, being in England;) "others might die without issue;" doubtless a true reason for so great a decrease amongst them: indeed one cannot read the history of previous times without being struck with the frequency of this fact, even when the legitimatizing of bastards was a circumstance of common occurrence. Other suppositions, and such as the anti-populationists would probably suggest as a full explanation of this decay, will be considered and refuted, in a more important stage of the present inquiry; I shall, therefore, conclude this appeal in our learned author's own words concerning these families: "They have been so worn away," says he, "that I "think the one half of them, if it were observed, (as "by their surnames it best might be,) would not be "found to have remained two ages after, and scarce "the one quarter of them to be remaining at the "present[1]."

(7) But to come lower down, it might be asked; where are the descendants of the great barons of England, whose signatures are added to Magna Charta, who ought, "unchecked," to have amounted to as many individuals as there are, perhaps, inhabitants in the known world, had the principle of population, now controverted, been true? it may, indeed, be asked, whether, peradventure, individual representatives of a quarter of them could be found? I am aware that I should be answered, that the direct checks, such as war, had interfered; and I shall not, therefore, inquire for the descendants of the nobles of England of later days; names as "familiar in our mouths as household words,"—"Bedford, and Exeter; Warwick, and Talbot; Salisbury, and Gloucester:"—the "happy few," the "band of brothers," have left, indeed, a small fraternity of sons; even their royal and gallant leader has not a descendant that bears his name; there is not left of the house of Plantagenet, one——male. Where, too, are the male descendants of the succeeding race, the Tudors? or the Stuarts? But it is not touching the royal houses, of this or other countries, we are speaking, (though such would be a most pertinent appeal,) but concerning their hereditary nobles.

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[1] Vestergan, Restitution of Decayed Intelligence, pp. 186, 187.

To return, therefore. In regard to that part of the ancient peerage of which we have authentic records, the proportion that has become extinct is astonishingly great; thus Sir William Dugdale observes, " that " of the two hundred and seventy families treated of " in the first volume of his Baronage, there were not " above eight remaining[1]." But, as it respects their diminution in a more recent and short period, Spelman thus speaks: " if thou examine the list of the barons " in the parliament of the 27th Henry VIII., thou " shalt find very few of them, whose son doth at this " day inherit his father's estate[2]," and he wrote thus but a generation or two after that date. In these later periods, I should disallow any objection grounded on the supposed peril in which the rank placed its possessors; on the other hand, it was evidently possessed of immunities which no other class of society enjoyed: thus Bacon says of a considerable part of the last period referred to; " as for attainders, there have " been but five (of the nobility) in thirty-five years, " whereof but two came to execution, and one of " them accompanied with restitution of blood to the " children[3]." At a period, then, when the population of the country was progressively increasing, what hindered this order from breeding up to the level of their food; instead of diminishing in numbers, so regularly and rapidly as they did? The law of population.

(8) But the argument which the registers of the Peerage afford is capable of being put in an authentic form, and at the same time divested of all reasonable exceptions whatever. Let us take, then, the creations of peerages, in a given term, a century for

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[1] Sir William Dugdale, Baronage, Preface.

[2] Spelman, De Non Tem., p. 42.

[3] Bacon, Works, vol. iii., p. 68.

instance, and one sufficiently distant to allow the geometric theory, were it in nature, full time to manifest its operation; and near enough to our own times to enable us to obtain all the facts necessary in order to arrive at a confident conclusion on the subject.

(9) I shall take, then, the seventeenth century; and in enumerating the peerages, created during that period, I shall reject those which merely gave a higher rank to those already conferred, as also those which were forfeited in the persons, whether of the first possessors, or their posterity, on whatever account; including, however, those which were subsequently so altered in their remainder, as to carry the honours, in default of heirs, into a new line of descent, which were, in every sense, and especially that which concerns the argument, new creations. It is evident, therefore, that the number thus selected would, *cæteris paribus*, have an advantage as to the prospect of increase, over every other class of the community. What then are the results of the inquiry continued down to the present time?

(10) The sum total of the additions to the peerage, selected as above, during the seventeenth century, was, according to Mr. Nicolas's Synopsis, two hundred and forty two: of these there remain extant at this day, sixty three only;—about one fourth! One hundred and seventy-nine of these peerages have then become extinct during the comparatively speaking short intervening period of time; besides, of course, a still greater proportion of extinctions which have taken place among the number of those peerages previously in existence, now dwindled to a few indeed!

(11) But, small as that number is, it is still too large to exhibit a just view of the question. The

inquiry is confined to one sex only, whereas there were female remainders in many of the patents referred to; indeed, in the great, but natural, anxiety to perpetuate such honours and the privileges annexed to them, a wide latitude was not unfrequently taken in their limitations, so as to give probabilities of succession otherwise than by descent, and consequently extraneous to the present argument. Thus, not merely heirs male and female, but sons-in-law, brothers, fathers, uncles, cousins, and their heirs, are found named, as successors to such distinctions, in case of failure in the direct line. For instance, "1678. James Touchett, s. and h. created "baron Audley and earl of Castlehaven in Ireland, "and earl of Castlehaven in Ireland 1634; restored "to the barony forfeited by his father, with remainder "to the heirs of his body; remainder to his brother "Martin Touchett, and the heirs of his body; re-"mainder to the daughters of his father and their "heirs[1]." Again, "William Craven, created baron "Craven of Hampstead Marshall, co. Berks, 12 Mar. "1626; with remainder, failing his issue male, to his "brothers. Created viscount Craven of Uffington, co. "Berks; and earl of Craven, co. York, with a new "creation of the barony of Craven, failing his issue "male, his brother having died, *sine prole*, to his "second cousin, Sir William Craven, of Lenchwyke; "with remainder to Sir Anthony, brother of the said "Sir William, and their heirs male respectively. The "said Sir William having died, *s. p.* his lordship "obtained a new creation of the barony, 11 Dec. "1665, failing the male issue of Sir Anthony Craven "or Sir Thomas Craven, next brother to Sir William "above mentioned, and elder brother of the said Sir

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[1] Nicolas, Synopsis of the Peerage, vol. i., p. 158.

"Anthony and his heirs male[1]." Instances of these collateral remainders are of perpetual occurrence, and especially at the period referred to. Several of the titles also, which are not extinct, have, however, merged; as, for instance, Sunderland and Marlborough; Suffolk and Berkshire; Winchelsea and Nottingham, &c.: in which cases it is superfluous to remark that, though the titles have not become extinct, yet the number of persons possessing them is diminished one half, and the chance of their continuance lessened. But the rectifications which the preceding observations suggest are unnecessary; the bare fact of only sixty-three successors to these titles remaining in existence out of the two hundred and forty-two progenitors, selected as the latter were, is fully sufficient to shew the fallacy of a theory whose fundamental axiom is that man "breeds up to the level of his food."

(12) As a matter of some curiosity, I have calculated what the posterity of the original number of these peers would have amounted to at present, commencing their increase with the period of their respective creations, supposing that they had "doubled "every five-and-twenty years, or increased in a geo-"metrical ratio[2];" which rate of increase Mr. Malthus says, "we may be perfectly sure is far within the truth[3]," as applied to the natural prolificness of human beings. They would have amounted, in the present year, of one sex alone, to about fifty thousand souls, instead of sixty-three individuals and their families! This he has asserted to be the natural progress of population in the North American states; and, when inquiring why an equal increase does not take place in Great Britain, answers: "The obvious reason to be

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[1] Nicolas, Synopsis of the Peerage, vol. i., p. 159.

[2] Malthus, Essay on Population, p. 5.

[3] Ibid.

" assigned is, the want of food; and that this want is " the most efficient cause of the three great checks to " population, which have been observed to prevail in " all societies[1]." "The obvious reason" is, in this case, at all events, stark nonsense; nor is the next main prop of the system, the preventive check, less absurd. The peers are undeniably a marrying class of society; but, to end all cavil on this head, there were about one thousand marriages celebrated by the possessors of these two hundred and forty-two titles; and even the one hundred and seventy-nine which became extinct, were possessed by four hundred and sixty-eight individuals. Two of the checks, then, as it regards this body, are wholly disabled, and I will make bold to assert, that they were as free from the third, that vice which could debilitate the constitution, as an equal number of any class of the Americans: but of this hereafter.

(13) It will hardly be contended, I think, that the foregoing facts do not bear upon the general argument, or indeed decide it; nor that the situation of the illustrious class appealed to was so different, at the period referred to, from what it has been since, as to weaken the conclusion at which we have arrived. To obviate, however, every possible objection, and to shew that the same principle is still in operation, I shall refer to the two last generations of the English peerage, (excluding the present one,) as given in Sir Egerton Brydges' valuable edition of Collins. With those, of course, who are "quietly inurned," there can be no more marrying or giving in marriage; the record of their lives is, as its respects the present inquiry, known and complete, and is therefore unexceptionable evidence.

(14) There were 480 individuals who possessed,

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[1] Malthus, Essay on Population, p. 340.

in two preceding descents, honours now in existence. These contracted 576 marriages; (so much for the idea of the peers not being a marrying class!) The number of children resulting from these marriages was 2303, or, to almost the utmost degree of exactness, four births to each. Of these children 1137, or about one half, lived to marry. But it must be remarked, as bearing essentially on the question, that, of this half, a very considerable majority consisted of the sons; the cases of celibacy, however, amongst the daughters, were not observably numerous, and the difference is easily accounted for. Of the sons, who nearly all marry, not a few "refresh themselves with wives "from amongst the daughters of the rich commoners "and merchants of the kingdom[1];" while prudential motives, as it respects the latter rank of society, as well as reluctance, perhaps, in the former to descend in station and rank, may operate in some instances to prevent the marriages of the daughters. I might take exceptions, therefore, at the additions which, on the whole, these extraneous accessions make to the order; but it is unnecessary, as it is on one sex alone that the demonstration rests, where, if it be complete, it will, in virtue of that irreversible law of Nature which preserves the perpetual balance of their numbers, necessarily extend to both.

(15) But the facts just adduced, though they completely negative the notion, that men "breed up to the level of their food," do not, however, at first sight seem to substantiate the position previously laid down, that, in a state of ease and affluence, they have a perpetual tendency to decrease. As far as they go, they appear to indicate that such a condition of life would keep their numbers very nearly stationary, with,

[1] Cumberland, Memoirs.

perhaps, a slight chance of a trifling increase. Such a conclusion is, however, so contrary to universal observation and experience, relative to the order appealed to, that I could not but suspect the correctness of the facts on which it appears to be founded; I therefore re-examined them, with no slight degree of attention, and was still surprised to find, that I had enumerated them accurately. I judged the matter to be one of those which Bacon says are "not to be given up, but waited on a little;" and in doing so, the difficulty cleared up. Sir Egerton Brydges' work contains the existing peerages only, from which, as before explained, I had taken the two preceding successions; the marriages in both having been, of course, prolific: but those which had become extinct during the same period, not being included, had escaped my consideration. That number, during the last and the present reign only, amounts to about one hundred. Now all the titles thus extinct must have been possessed by, at least, one, some by two, three, or more individuals, amongst whom were, doubtless, the usual proportion of marriages. It is needless to remark that none of these connexions could have left a male heir. I regret that I have not been able to make out, very correctly, the exact number of these marriages; but, on the most moderate computation, they would amount to a sum, which, added to the former ones, namely, those of the two generations of the existing peerages, would diminish the proportion of births to, perhaps, little more than three, instead of four children each. The lowest addition, however, which can thus be made to the number of marriages will abundantly suffice to reconcile the results previously given, with the notorious fact, that the peerage, as a body, has a constant tendency to a diminution in its numbers.

(16) The only remaining objections which can in-

validate the foregoing conclusion, (for the idea, that the peers do not, almost universally, marry, has already been disposed of,) must rest upon one of these two suppositions: first, that they postpone their marriages, so as to interfere with the full development of the principle of prolificness; or, second, that their station in life is unfavourable to their health, and, consequently, to their fecundity. The first, I think, is thus answered, as respects the marriages referred to: in 284 cases, the ages of the husbands were ascertained, and they amounted all together to 7979 years, giving rather above 28 years each, as the mean age of marriage; being nearly ten years earlier than that fixed upon by the philosopher before referred to, Aristotle, as that most propitious to the multiplication of the species; and, at all events, sufficiently early to give full scope to the prolific powers of nature. The period of life, indeed, in which the greatest "intensity" of marriages took place, in this sex, was at the age of twenty-two; but it is somewhat remarkable, that the most prolific one happened to be about double that age. Regarding the peeresses, it is superfluous to say, that they were sufficiently young when they became wives; the ages of 118 of them, when that event took place, were ascertained: they amounted together to 2420 years, or about twenty years and a half, as the mean term.

(17) The remaining suspicion, that the peers are naturally inferior to the generality of mankind in their original stamina, or that they have so abused their advantages as to have reduced themselves to that presumed state of inferiority, by excesses of whatever kind, remains to be noticed. And this notion is as easily answered as the former one, and is indeed sufficiently refuted by their early and almost universal marriages; which, notwithstanding all that may be said in

favour of moral restraint, as the contrary habit is denominated, are ever the best safeguards and surest proofs of personal and domestic virtue, and consequently, of health itself. But this, as the only remaining mode of evading the conclusion already arrived at, shall have that specific answer of which it is fully susceptible. Those individuals among the 480, whose ages I have been able to ascertain, amount to 331, their united ages at death, including those who died "infants," amounted to 21,188 years, or, on the average, full sixty-four years each; a term of life wholly unequalled in any other rank. Of that small number, 85, or above one quarter of the whole, lived to between 70 and 80 years of age; 41, or an eighth, to between 80 and 90; and eight survived to between 90 and 100 years: proportions of longevity also equally unprecedented. And, in order fully to meet the objection now rebutted, I may add, that their peeresses survived to a still greater age, being, on an average, upwards of 72 each, at their decease.

(18) Adverting to the Irish peerage, I find that the prolificness of marriages was precisely the same as in that of England; that the united ages of 81 of the peers at the time of their marriage were 2219 years, or rather more than 27 years on the average; that of the peeresses, whose ages at their marriage I could ascertain, gave less than twenty each: the longevity of both was nearly the same as in the English peerage. I examined the Scottish peerage with the same view, and found all the foregoing proportions to be somewhat exceeded, but in a very trifling degree. Taking the whole together, I still found 22 the age in which the greatest number of peers married[1].

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[1] It may be interesting to see the relative numbers of both sexes marrying at the different ages specified, calculated on 870 first marriages of the

(19) But, as it would be inconvenient to accompany the foregoing proofs with the tables on which they have been constructed, on account of their great length, their accuracy may, perhaps, be disputed. I will therefore appeal to facts, which will fully confirm the general deduction without the necessity of verifying them by inserting the particulars. The peerages of Ireland, at the time of the Union, amounted in number to 238; in a quarter of a century they were reduced to 198, more than one sixth of them having become extinct in that comparatively short period. No stronger corroboration of the principle at issue could possibly be given; none which could more fully substantiate the general facts from which it is deduced.

(20) It will hardly be necessary for me to explain, that it is not this particular station of society alone to which I exclusively apply the argument; on the con-

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peers, and 602 of the peeresses, of the United Kingdom. In the latter case, however, I neglected to distinguish the first from the subsequent marriages; they are all, therefore, included. Calculated on a radix of 1000, the following would be the proportion at each age:

Ages at Marriage.	Number of Peers married at these ages.	Number of Peeresses married at these ages.
Under and at 13	..	12
14 to 17	7	163
18 to 21	119	354
22 to 25	284	259
26 to 29	254	110
30 to 33	146	48
34 to 37	79	25
38 to 41	40	16
42 to 45	31	3
46 to 49	24	10
50 to 53	10	
54 to 57	5	
58 and upwards.	1	
	1000	1000

Had the second wives been excluded from the last column, it would have been found that very few peeresses are married, as the first wives of peers, after the age of 25.

trary, it is equally referrible to every class in which ease and affluence prevail, and which is removed, therefore, from the operation of the checks to population to which so much influence is attributed. The peerage was selected merely because it forms a rank so completely separate from the rest, and concerning which all the circumstances are so accurately recorded as to enable us to pursue the inquiry with the utmost confidence and precision. The same may be said, to a certain degree, of the baronetage; and that order again affords abundant proof of the fact, or rather principle, contended for throughout. For instance, from the institution of this order in 1611, to the termination of that century, there were 936 baronets created: of these, only 260 remain at the present day; 676 having become extinct, though several of these titles also had female and collateral remainders. It would be an easy, though a perfectly superfluous task, to prove that this rank has been as free from the operation of the positive or the preventive checks as the former, and far more so than any inferior class of society.

(21) Nor is this law of Nature in local operation merely, or confined to any particular period of time; it results from a perpetual and universal principle. Hence, the superior rank in every age and country has constantly diminished in number. Addison, in his "Remarks on Italy," speaking of Venice, says, that "M. "Amelot reckoned, in his time, two thousand five hun-"dred nobles that had voices in the great council; but, "at present, I am told," says he, "that there are not, "at most, fifteen hundred, notwithstanding the addi-"tion of many new families since that time." "It is "very strange," he continues, "that with this advan-"tage, they are not able to keep up their number,

“considering that the nobility spreads equally through “all the brothers, and that so very few of them are “destroyed by the wars of the Republic[1].” The same writer gives a striking instance of this tendency to extinction in elevated rank, in the case of the Medician family; observing that, notwithstanding all their endeavours to perpetuate their race, the mausoleum they were then erecting, probably one of the most costly fabrics in the world, “would not, perhaps, be finished before their race was extinct[2].” “The ancient “nobility of France also,” as De Chastelux observes, “has become, by degrees, nearly extinct[3].” The same is true of that of Holland; and to a still greater degree. Heylin says, that, even in his time, “the nobility and “gentry there were so worn out, that there were not “above three families of gentlemen left[4].” Speaking of this fact, another writer exclaims, “Every thing “insensibly drops away and is annihilated; the Counts “of Egmont are extinct, nor does the house of Lalain “any longer exist, any more than do several noble “families who, for antiquity, were inferior to none “in all Europe[5].” In the less luxurious regions of the north, the same law of Nature prevails: thus Busching says of Norway; “formerly there were many “noble families there, but most of them are now “extinct[6].” Even in gradations of society less elevated above the ordinary condition of life, the same principle seems to operate though in proportion to the difference. Thus we are told, that “in the town of Berne, from “the year 1583 to 1654, the sovereign council had “admitted into the bourgeoisie 487 families, of which “379 became extinct in the space of two centuries,

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[1] Addison, Remarks on Italy, Works, vol. v, pp. 185, 186.

[2] Ibid., pp. 314, 315.

[3] De Chastelux, Essay on Public Happiness, vol. i., p. 195.

[4] Dr. Heylin, Cosmog. of the World, lib. ii., p. 31.

[5] A New Journey through the Netherlands, Greece, &c., p. 263.

[6] Busching, Geog., vol. i., p. 181.

" and in 1783 only 108 of them remained. During " the 100 years, from 1684 to 1784, 207 Bernoise " families became extinct. From 1624 to 1712, the " bourgeoisie was given to 80 families. In 1623, the " sovereign council united the members of 112 different " families, of which 58 only remain[1]." The bourgeoisie constitute the higher class of the Bernoise population.

(22) The same cause, one of the main principles in the law of population, has produced the same effect in all ages. Hippocrates, as we have already seen, asserted the comparative sterility of the nobles of Scythia[2]; Aristotle and others, the rapid extinction of the principal families of Greece[3]; and, not further to labour a matter that must be already abundantly plain, I will conclude with the same fact in relation to ancient Rome, as recorded by Tacitus. "Of all " the families," says he, " who were denominated by " Romulus, the older nobility, or of those added by " Lucius Brutus, and called the younger, there were " few remaining. Even such whom Cæsar, the Dic- " tator, by the Cassian law, and such whom the " Emperor Augustus, by the Senian law, had created " patricians, were now extinct[4]." The learned reader needs not to be reminded how numerous were these later creations[5].

(23) Thus in all ages of the world, and in every nation of it, have the highest ranks of the community been the most sterile, and the lowest the most prolific. As it respects our own country, from the lowest grade of society, the Irish peasant, to the highest, the British peer, this remains a conspicuous truth; and the

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[1] Malthus, Essay on Population, p. 278.

[2] Hippocrates, De Aëre, Locis, &c., § iii., p. 292, l. 53.

[3] Aristotle, De Repub., l. iv. Gillies' Trans., p. 107.

[4] Tacitus, Ann., l. xi., c. 25.

[5] See Gibbon, Decline, &c., vol. iii., p. 41.

regulation of the degree of fecundity conformably to this principle, through the intermediate gradations of society, constitutes one of the features of the system developed in these pages. The law of population for which I have contended, and which, I trust, may now be regarded as established, acts not, therefore, by means which afflict or degrade the species, but by those which confer and secure the greatest measure of individual and general happiness:—in a state of penury accelerating their increase, and creating and diffusing, by means of that increase, greater affluence; and again constituting that affluence the regulator, or, if it may be so termed, the real check to human prolificness, so that mankind should multiply up to the means of their enjoyment, and yet never exceed them. But to return. The distinguished rank we have been contemplating exists only as an exception, whether it respects the political or natural condition of society. It exhibits a state to which a greater number of the species have to administer, and, therefore, implies a larger population, than, were it general, could be sustained. Hence, Nature interdicts its increase, as happily for itself as for the mass of the community; otherwise it would end in destroying itself, after having so multiplied as to monopolize all the bounties of Providence, and to become a curse, instead of being, as I now hope it generally is, at once an ornament and a benefit to society at large. Thus wisely, then, is it ordained, that in no age or country of the world are the privileged orders the proletarii. Hence our nobles are, according to these views, as fully liberated from the preventive check as every other order amongst us.

(24) I cannot refrain, in conclusion, from availing myself of the language of a book, which on this subject

also delivers to us, from the remotest antiquity, a truth equally confirmed by philosophy and by history, and which it has been the purpose of this chapter to establish; that though men of exalted station may dream of perpetuating their race, "and think that their houses "shall continue for ever, and their dwelling place to "all generations, and call their lands by their own "names;—nevertheless, MAN BEING IN HONOUR "ABIDETH NOT!"

CHAPTER XXIV.

OF THE LAW OF POPULATION. CONCLUDING OBSERVATIONS ON ITS PROOFS.

(1) Having now gone through the several proofs of the Law of Population, as propounded in this book, I may repeat what was said when they were first enumerated; there do not appear to be any others by which the principle, now fully before the reader, could be either established or subverted; nor do I think any further attempts are necessary to its full demonstration. On the contrary, singular as the remark may appear, I fear that the evidence in its favour has been already too multifarious and minute. After the mind has become sufficiently convinced of the truth of a position, it is quite possible to multiply unnecessary evidence till it begins to be fatigued, and at length even distrustful; and what would often, in the earlier stage of a discussion, have been received as an incontrovertible fact, is, perhaps, at last regarded as an ingenious and laboured hypothesis.

(2) But, as in the establishment of a principle, which many will, at first, be disposed to regard as a mere novel and specious theory, it became necessary to advance a sufficient number of authentic proofs: so, it is hoped, the reader will not think that they have been unnecessarily or ambitiously accumulated: especially those contained in the tables; on which, rather than on the evidence of more general observations, the principle has been mainly established, agreeably to the

express direction of the great founder of the method of induction which has been ordinarily pursued throughout. " Atque in super," says Bacon, " cum tantus " sit particularium numerus, et quasi exercitus, isque " ita sparsus et diffusus, ut intellectum disgreget et " confundat, de velitationibus, et levibus motibus, et " transcursibus intellectus, non bene sperandum est; " nisi fiat instructio et coordinatio per tabulas inveni" endi idoneas, et bene dispositas, et tanquam vivas, " eorum quæ pertinent ad subjectum, in quo versatur " inquisitio, atque ad harum tabularum auxilia præ" parata et digesta mens applicetur[1]."

(3) It may be necessary, however, again to call the reader's attention to the nature of the argument thus founded on the tabular proofs adduced in this work. It is constructed, not upon selected or garbled proofs, but upon the whole of the known facts bearing upon the subject; which facts also, are of themselves of so unconnected and dissimilar a nature, that they would have contradicted each other, and have led, infallibly, to the most opposite conclusions, as respects the principle at issue, had not that principle and its proofs been equally true. Thus, the law of population, now, it is hoped, established, was deduced, first, from the proportions between the marriages and baptisms of different countries where those facts are publicly registered; next, it was inferred, with equal certainty and precision, from the censuses of other countries where such registers are entirely wanting; and lastly, the general principle has been established by a process distinct from both, namely, by the relative increase in the numbers of different districts of certain countries. Now, each of these modes, I am aware, is open to particular, though not very valid objections; but, happily

[1] Bacon, Novum Organum, l. i., § cii.

for the general conclusion, those objections are wholly destroyed when the difference in these methods of proof is considered. Thus, as respects the first, it is clear, that the only possible objection to the argument, as founded on the registers of the marriages and births of the different countries specified, is, that those registers are erroneous, and, what is not a very rational supposition, that the errors are so exactly graduated, as to produce the results in question. But, then, the second method, to which we are fortunately compelled to resort, in consequence of the want of information applicable to the first, entirely silences that objection; as the same law is deduced by this process, from facts of a nature totally dissimilar; not from a comparison of the records of marriages and births, but from the relative numbers of different ages in existence, ascertained by actual enumerations or censuses. But, if it be again objected to this mode, that it does not demonstrate the natural or individual prolificness of the human race, but merely the degree in which circumstances allow it to be developed, (a singular exception, nevertheless, when it is considered, that it is the censuses of the United States[1] on which this proof is mainly founded,) this cavil is entirely obviated, by referring to the former method; that of establishing the same principle on the registers of the actual marriages and births. Lastly, in other instances, the relative increase of the population, exhibiting, as it does, the various modifications of the same principle, and obviating, therefore, the remaining objections against it, at once completes the variety and adds to the certainty of a series of proofs, which thus mutually check each other, and heighten the general result into actual demonstration. Thus obtained, it is hoped the position is rendered as certain as a geographical point, which has been ascertained by a series of observations, taken from different stations, in a trigonometrical survey.

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[1] It is conceived, this method could not be properly resorted to regarding a population in which, owing to the prevalence of manufactures, or other causes, great internal fluctuations are constantly occurring; such as, for example, England, and, perhaps, Scotland, where, though it has not been tried, I am confident, for these reasons, it neither would nor ought to apply.

(4) But admitting the Law of Population as now developed to be substantiated, still a question may possibly arise, as to its final effects. Disproving, as it does, the notion of the geometric ratio of human multiplication, and, consequently, liberating the principles and feelings of mankind from the pernicious tendencies of that degrading theory; still, it may be asked, whether the measure of human increase, regulated as explained, may not itself, at last, exceed the means of subsistence. To this, it would be abundantly sufficient to answer, that even were such a possibility not denied, still the very terms of the proposition (implying, as they do, space perpetually increasing in productiveness, and population exhibiting a constantly diminishing ratio of fecundity) would prove any such period indefinitely distant; I think, indeed, literally speaking, infinitely so. Seeing that Nature has calculated the principle of prolificness, with an evident view to prevent such a result, that her calculation is accurate, and, consequently, that such a period can never arrive, amounts to a moral demonstration: it amounts to more, if the elements of the calculation are duly attended to. They prove, that population, approaching "the level of the means of subsistence," will never reach, much less surpass, that level; constituting, therefore, a demonstration in physics, as certain as that by which it may be illustrated in mathematics, that the curve of the hyperbola will never

touch its asymptote: and this, it is humbly conceived, is the true solution of a problem, inexpressibly interesting and important, at once, to philosophy, to politics, and to religion. It remains to be shewn, that this principle of population is in unison with the experience of mankind, and that it dictates a system of political philosophy, the obvious tendency of which would be to administer the greatest possible degree of individual happiness to the utmost possible number of human beings. These important inquiries will be pursued through the remaining Books of this treatise.

APPENDIX TO BOOK IV;

BEING

A DISSERTATION

UPON THE BALANCE OF THE FOOD AND NUMBERS OF ANIMATED NATURE.

The ensuing Dissertation is the substance of two lectures, delivered before a Philosophical and Literary Society, of which the Author has the honour of being a member; and, as its argument goes to the disproof of that superfecundity which, in the theory opposed in this work, is equally asserted of all the inferior orders of animated existences, as of human beings, it seems a corollary of the preceding argument, if not an essential part of it, and is therefore inserted. The author regrets that want of time has prevented the subject from being presented in another form, and accompanied with those references and illustrations of which it is so susceptible; though to have discussed it as a mere naturalist, would have been foreign to the main design of the argument. It is now published, nearly as delivered, with the addition, however, of the quotation from Addison, with which it commences.

DISSERTATION.

(1) "I AM guided by the spirit of a philosopher," says Addison, "as I take occasion to reflect upon the regular increase and "diminution of mankind."—"A bill of mortality is, in my opi- "nion, an unanswerable argument for a Providence. How "can we, without supposing ourselves under the constant "care of a Supreme Being, give any possible account for that "nice proportion which we find, in every great city, between "the deaths and births of its inhabitants, and between the "number of males and that of females, who are brought into "the world? What else could adjust in so exact a manner "the recruits of every nation to its losses, and divide these "new supplies of people into such equal bodies of both sexes? "Chance could never hold the balance with so steady a hand. "Were we not counted out by an intelligent Supervisor, we "should sometimes be overcharged with multitudes, and at "other times waste away into a desert: we should be some- "times a *populus virorum*, as Florus elegantly expresses it, a "generation of males, and at others a species of women."

(2) But the same author proceeds to apply the idea to that which is the more immediate object of the present discussion. "We may extend this consideration," says he, "to every "species of living creatures, and consider the whole animal "world as a huge army made up of innumerable corps, if I "may use that term, whose quotas have been kept entire near "five thousand years, in so wonderful a manner, that there is "not probably a single species lost during this long tract of "time. Could we have general bills of mortality of every "kind of animals, or particular ones of every species in each "continent and island, I could almost say, in every wood, "marsh, or mountain, what astonishing instances would they

"be of that Providence which watches over all his works!" So far this inimitable writer; and if we express the idea which his argument evidently, and of necessity, implies throughout, namely, the supply of the means of subsistence for the beings perpetuated in these just and exact proportions, the principle is fully unfolded which it is the purport of this argument to establish,—the balance of the food and numbers of animated nature.

(3) The proportion observable between the numbers and necessities of living beings and the means of subsistence evidently prepared for them, is one of the most important and interesting facts which present themselves to human contemplation. Our necessary familiarity with the subject may, however, withdraw us from its consideration altogether, or abate those feelings of admiration, with which it must otherwise be regarded: or, on the other hand, if our minds be thoroughly awakened to its importance, they may be altogether lost in that astonishment, or overwhelmed with those feelings of devotion, which it is so well calculated to excite. But, could we approach the question with calm, and yet fixed, attention; and consider, even in one single instance among the innumerable multitude of existences, the necessity to be supplied, and the means by which that supply is accomplished; the minute and complicated anticipations; the infinitely ramified, yet perfect, adaptations involved; would, to our finite apprehension, rise into a miracle: but that a universe of beings unimaginably numerous, varying, through all its countless tribes, the mode and means of existence; seemingly disconnected, yet mutually and essentially dependent; should be thus adequately and constantly sustained, is what reason perhaps can never fully comprehend, and the continuous evidence of our senses can alone compel us to believe.

(4) To point out the various steps in the processes of universal sustentation has been among the most exalted pursuits of true philosophy; but the utmost term of life allotted to human beings, though possessed of the highest intellectual powers, would be utterly inadequate to illustrate the subject, nor have the united efforts of such, throughout all past ages, sufficed for this purpose: one thing is, nevertheless, observable; the more knowledge has accumulated the more sacredly plain has this branch

of the divine economy become; so that, up to the present period, thousands of years have elapsed since mankind doubted, if they ever did previously doubt, of the sufficiency of the means of subsistence which Nature furnishes for all her animated offspring. Now, however, and for the first time, as far as my means of information enable me to determine, there is broached a contrary dogma,—an indelible disgrace to the age, so far as it has been received, namely, that there is "a constant tendency in all animated life to increase beyond the nourishment prepared for it:" that "Nature has scattered the seeds of life abroad with the most profuse and liberal hand, but has been comparatively sparing in the room and nourishment necessary to rear them." The deficiency thus represented, as established by all the analogies of nature, is pronounced to have been the source of the severest and most degrading evils which the human race has suffered. The ancient philosophy and policy of mankind are, therefore, at once contemned, and new principles attempted to be established of a diametrically opposite tendency, the practical effects of which, cruel and revolting as they are, are no longer endeavoured to be concealed, and are beginning to be realized: hence every man that would cherish feelings of unabated gratitude towards an all-sufficient Providence, and of affection to his fellow-creatures, seems called upon to review that train of reasoning, or, rather, to open his eyes to those facts, which have hitherto conducted mankind to a happier conclusion.

(5) For myself, I confess my mind recoils with feelings not very easy to be expressed, and not, perhaps, very consistent with the deliberate reasonings due to such a subject, from the assertion, that Nature, or, to speak more intelligibly, the Author of Nature, has made this grievous miscalculation in reference to the food and numbers of his sentient offspring: or in other words, a calculation that takes universal insufficiency as its basis. In rebutting this strange hypothesis, I shall avail myself of the analogies by which it professes to be supported, and even extend them; appealing in turn, not only to animated but to inanimate creation. Each of these, when duly considered, have the strictest mutual relations; and in all their complicated adaptations, involving calculations the most minute as well as stupendous, nothing is superfluous,

nothing deficient. "Natura non abundat nec deficit," said a heathen philosopher, in viewing the operations of Nature: one, with something beyond the feelings of a heathen, exclaims, when addressing its great Author; "Thou hast ordered all things in measure, and number and weight!"

(6) To begin, then, with the immensities of creation: what is there to sanction the daring idea of any thing there being left disproportionate, or in the slightest imaginable degree erroneous? If we consider the universal heavens, the work of his fingers, the moon and the stars which he has created, whether we view them with the eye of a peasant, who "hears their still song harmonious breathed into his heart," till, like Homer's shepherd, he "laughs in his soul;" or, led by philosophy, we stand, like Milton's Uriel, on the orb of the sun, and behold the lamps of eternity kindling around us, while Science, which assists our sight perhaps as far as angels ken, discovers evanescent luminaries, in innumerable throngs, emerging into view, while reason speaks of multitudes, still more innumerable, sunk, as it were, at increasing depths in the unfathomable ocean of space, or spreading over an eternally enlarging circumference, till thought itself, as well as vision, fails, and recoils within us; still all above and around us, however vast and complicated, appears in perfect and everlasting harmony. As we gaze, we hear the hierophant of this mysterious temple of Nature, our immortal Newton, explaining the mechanism of the stupendous scenery, and telling us, in terms too vast for simple apprehension, the various magnitudes, distances, densities, velocities, orbits, excentric or concentric, of the rolling spheres, all of them, with their various phenomena and several influences, as having exact relations to each other, constituting essential parts of the same system, and obeying those simple laws which preserve them and the universe, of which they form a part, in their present existence:—laws, by which the central ruler, the steadfast sun, not only governs his universe, but by which himself is governed, and whom, therefore, while in imagination we are beholding surrounding creation from his sphere, we feel, as it were, rock beneath us while he rolls his planetary orbs around him, reeling beneath the mighty rush and reaction of the complicated machine. Bodies of such magnitude, forces so complicate and immense in their

moment, were they not in all their evolutions most perfectly balanced, we may well believe, would instantly occasion the "wreck of matter and the crush of worlds." Modern observations indeed instruct us, that the minutest of those apparent aberrations observed in the motions of the heavenly bodies, in iterating their ancient courses, resolve themselves into effects of the same unerring and universal laws which were before developed, and which prescribe recurring cycles which may be accurately calculated, though the evolutions of each may far outnumber the years of our universe. Analogy, therefore, inclines us to believe, that our entire planetary system, and those by which it is surrounded, have their mutual and necessary influences, so as to connect creation, from its boundless circumference to its ubiquital centre, in one eternal and unbroken chain, of which, perhaps, (but here, I confess, I give imagination the rein,) those strange and mysterious bodies, which often suddenly visit our system, and continue to excite the astonishment and curiosity of the present times as powerfully as they did the apprehensions of past ages, may be the visible links, or perhaps are, in that universal law of attraction by which all Nature seems governed, moving and self-adjusting weights in the balance, which preserve, in all its unknown vibrations, the eternal equipoise of the universe.

(7) But, to leave the province of speculation for that of demonstration;—if the magnitudes, motions, and distances of the heavenly bodies are thus reciprocally regulated, which it is the legitimate office of geometric calculation to shew, then the same science leads us to the inevitable conclusion, that every atom of matter, as well as every moment of time, is necessarily included in the divine computation. The grain of sand, therefore, falling from the widow's hour-glass, and the instant of time it expresses in its descent, do not merely furnish an illustration, but they form essential parts, of that magnitude, motion, and duration, which constitute the harmony and perpetuate the existence of the universe.

(8) But to ascend into this "our visible diurnal sphere," let us pursue a like inquiry, and examine whether there is the slightest countenance for the belief, that there is any thing in the laws, ratios, or whatever we may denominate them, of Nature, which is not in the most perfect and exact accord-

ance. Geology, which presents us with matter in its mighty masses and general configurations, and chemistry, which submits its minute particles to our examination, convince us to the contrary. It has been the triumph of the latter to prove, that, whatever be the essence of that matter, the ratios in which it combines, under different forms, are determinate and unalterable. But to attend for a moment to physical geography, with which our inquiry is more obviously connected: the elements of this our earth could, as Nieuwentit has observed, sustain no change without being fatal to vitality; that of the air, for instance, on which almost all life, whether vegetable or animal, momentarily depends, and to which it is manifestly adapted. But it is the distance at which our world is fixed from the central luminary, the source of life, which attempers those elements, and presents them in their present forms. Any considerable variation in that distance, therefore, Paley need hardly to have observed, would cause such a change as to render them totally unfit for the purposes they are plainly intended to serve. The position then of the earth, which had been determined by other laws, especially those of mutual attraction, becomes, as it respects all its animated possessors, a law of vitality: consequently, of life, as it now exists, (and we have to do with none other,) the remaining planets are, as it were, joint guarantees. It appears, indeed, difficult not to believe that the law of the universe has connected all its several parts in a mutual and necessary relation, as well as that the whole is dependent upon its first great and eternal Cause? Possibly, therefore, any disturbance, even in a distant system, would affect our own; and it seems a species of rational astrology, to hold, that the more distant of the heavenly bodies, as well as the nearer ones, have their material influences upon our planet. Perhaps then that morning flower, and the beautiful flutterer, the ancient emblem of life, upon its fragrant bosom, could neither of them exist without "the sweet influences of the Pleiades." But, to recall myself from, I fear, too fanciful a view of the subject; it is certain that no cause, which should materially alter the position of the earth in regard to the sun, (a change in the forces of attraction would be such a cause,) and consequently derange the component parts of, or destroy, the vital elements, could fail being fatal to all existences in this our world.

(9) Speaking of the elements, it will be observed I make use of the term in a popular sense, intentionally divested of those scientific definitions and analytical distinctions which would introduce confusion rather than perspicuity into a subject meant to be regarded in a practical point of view only. These elements, therefore, I would observe, whatever be the efficient causes, are actually kept in their due proportions; and as it is the intention of Nature, as far as possible, to people them, the laws of vitality are framed with the minutest and most perfect adaptations to that purpose; so that their respective inhabitants, inconceivably numerous and wonderfully varied, are, when accurately examined, but so many aërial, terrestrial, or hydrostatic machines, whose impetus is life, all of them most perfectly conformed, in all imaginable respects, to the element in which they move and have their being, and fitted most precisely to the position in which they are placed. Even below the surface of the earth another world of beings exists and inhabits, forming a distinct race, but diversified probably as much as those with whose modes of existence we are more familiar. These, whether worms, insects, or even quadrupeds, exhibit, as far as our more limited knowledge of them enables us to judge, instincts as surprising, and habits as wonderful, as those which are the objects of our constant attention; all conforming to their peculiar situation, and manifesting an organization completely adapted to it.

(10) But physical geography must be further alluded to, as having a special relation to this important subject. Not only the distance of our earth from the sun, but the different position of its several parts in relation to it, must be considered; her globular form causing the solar rays to impinge with less force the more remote from the centre of the hemisphere opposed to him; and again the declination of her rotary axis from the perpendicular of the plane of her orbit, occasioning those annual vicissitudes to which her surface is subject. The elements are thus not only modified by position into different climates, but these again are varied into the revolving seasons, and how wonderful are the corresponding variations of the animal kingdoms, and still how exactly adapted is each to

the necessary change! Saving man alone, he, indeed, seems to have the unlimited charter of the earth, and for his sake a few of those animals and vegetables also, which are of prime and universal necessity to him.

(11) But all these surprising adaptations of animal life, in all its forms, to the elements which it peoples, and, again, to the changes those elements undergo, in consequence of varying climates and seasons, would serve no purpose whatever, unless these were met by another series of wonders,—those supplies of food, without which life could not continue, in a single instance, and which, to support animated nature throughout our earth, must vary with the elements, the situations, the climates, and the seasons, and consequently be adapted to them all. And to provide these supplies, thus varied in all places, at the proper periods, and (as I maintain) in sufficient quantities, involves a comprehension of design, an intricacy of calculation, and a series of anticipations, which I may safely assert none can comprehend save he who accomplishes them. In every single instance, the necessity that is to be provided for, and the means of its supply; the appropriate instruments, if I may so express myself, by which the food is taken, and the organs into which it is received, have the strictest relation to each other, which is still preserved through all the innumerable varieties of animal existence; making, on the whole, as vast a demand upon Infinite intelligence and benevolence, in the conservation, as in the creation of the world.

(12) Hitherto we have principally alluded to the varieties in the modes of existence as strictly conforming to the position in creation in which they are placed; these varieties are numerous far beyond common apprehension, and every age is adding to their amount by new discoveries; but we have to extend our views on the subject yet further. The numbers of each of these distinct species have not only a necessary relation to the circumstances in which they are themselves placed, but to the other tribes of beings, extending, not merely to those with which they seem in more immediate contact, but, in all probability, to the very extremities of existence itself. It is difficult, if not impossible, to doubt, that a disproportion in any of these would be fatal to the whole; so obviously essential is their mutual connexion. The necessary operation, then,

of the distribution of existence into masses so minutely determined, and yet so immensely varied, is accomplished by regulating the measure of the reproductive principle, as well as the duration of life, in every class, so as to maintain the necessary proportions, and preserve the universal balance of animated nature. This I shall shortly advert to hereafter.

(13) Let us here, then, pause for a moment, and, without again dwelling on the connexion between the minutest existence in creation with its immense masses, or the wonderful adaptations of every climate, element, season, and situation, to the condition and necessities of animal creation, or the intimate relation which its several parts bear to each other and to the whole, let us enlarge our minds, as far as we can do so, to the consideration of the incalculable, and all but infinite, number, for every individual of which this provision has to be made. Placed at the summit of these, man, concerning whose multiplication so many fears are now afloat, is, compared with most of them, a solitary, with any of them, a sterile being; and yet a thousand millions of his species traverse the earth. Leaving out of our view those larger animals, whose number he generally determines, and looking down through the inferior tribes of creation, in whatever element, how do they multiply! The chain of existence which, at once connects and sustains all animated beings is seen descending from rank to rank, and still diminishing, till at length it eludes the sight; when the eye, assisted by that science which taught it to penetrate far into boundless space, again pierces deep into an opposite infinity, and traces its catenations, lengthening far below the supposed limits of possibility, till at last vision utterly fails, and thought looks down as from a fearful brink, and beholds the lessening threads of life still sinking into a dark and immeasurable depth, only fathomed by the eye of Omniscience. The links of this chain, sustained by the hand of its eternal Artificer, who can enumerate? As they diminish in magnitude they multiply in number, still augmenting the miracle, till they become at once innumerable and invisible. Compared with these, what are the numbers of the leaves of the forests, or the sands of the ocean? In ten thousand forms they fill the air we breathe; they cover the earth on which we tread; they saturate the waters of the

stream; they tinge the waves of the ocean; they flash like lightning upon its shores. A single leaf, as St. Pierre has said, and without an hyperbole, is itself a continent, and a drop an ocean to myriads of animated beings, infinitely diversified, and many of them, if we may believe our best naturalists, invested with a beauty which Nature rarely lavishes upon her larger offspring; at all events, with an organization as perfectly adapted to their condition as that of the mammoth or the leviathan. "Rerum natura nusquam magis quàm in minimis tota est."

(14) Vain then are all human comparisons—vain the power of numbers to describe the flood of vitality which inundates our universe; as vain were it to attempt to explain by what process it is sustained: but, though we were not able, even in a single instance, to trace the means of preserving life, so as to extend it by analogy to the whole, still the fact that it *is* sustained in being and well being; that it is reproduced and continued; is a full and everlasting disproof of the daring notion of the superfecundity of animal existences. Driven, therefore, to no absurd or impious notions respecting the operations of the Deity, while contemplating these his astonishing works, which demand the exercise of his boundless perfections, we exclaim, in the language of a poet of antiquity, "O God! how wonderful are thy works! In wisdom hast thou made them all! The earth is full of thy riches!"

(15) Some there are, indeed, who profess to read very different doctrines in the volume of Nature. To them the heavens declare nothing but a fortuitous dance of atoms, which ultimately resolved themselves into those bodies, whether luminous or opaque, to whose laws we have been alluding; the firmament showeth the handywork of Chance—" the great *Cham-Chi-Thaungu*" of atheism. All those wonderful forms and adaptations, which have been slightly noticed, are the creations of accident, and the modifications of necessity. Life itself, in their unintelligible jargon, as incomprehensible to themselves as to all others, is the improving product of an " animated film," which, when the Fates spin fine enough, begins, it appears, a-thinking. At a period when philosophy spurns the idea of equivocal generation, these give to man a poorer pedigree than to a maggot, or otherwise they assert him to have had no beginning; investing, therefore, a finite being with an attribute

which they refuse to a Deity as too incomprehensible. With not one of these, whether on the notion of the superfecundity of animal creation, or on any other moral argument, would I waste a word. "The fool hath said in his heart there is no God;" and there is no miracle he will not believe to make good his folly; no folly he will not embrace to confirm his faith. The very food of atheism is credulity.

(16) But there are others to whom the argument, which will be now confined within narrower limits, is most seriously addressed; who, firmly believing in the Deity, recognizing his power in the immensity of his works, and his wisdom in the laws by which they are governed, nevertheless hold notions, which not only to common apprehension, but still more on careful examination, militate against his essential attribute of goodness. Touching animated nature, they agree that his power is boundless, his wisdom infinite, but that his providence fails; and regarding the immensity of the numbers, to which we have been alluding, and the prolific powers with which he has endowed them, they utter, in effect, the doubtful and derogatory inquiry, For multitudes like these, "*can* God spread a table in the wilderness?" Above all, as it respects his supreme creature, man, whose prolificness they pronounce to exceed so vastly the means of subsistence which his Maker has prepared for him, they still more emphatically exclaim, "But can he give bread also? or provide flesh for his people?"

(17) To answer this query, which, however disguised in language, the system I am opposing plainly and incredulously propounds, is the object of the present argument; one part of which, and that derived from natural theology, I am now pursuing: and, if the language employed is occasionally enriched by expressions taken from the inspired volume, it will be observed that none of my proofs are made to rest exclusively on that sacred foundation.

(18) Hitherto the balance of food and numbers has been chiefly established by arguments founded on analogies, which will be still further pursued: and what surer guide can we have than analogy, that sole expounder of so many of the doubts and difficulties which are spread over the book of Nature, and without which we should hardly be able to apprehend a single passage in that mysterious volume? If the laws of matter have

such a perfect adaptation to their end—that of continuing unchanged its present conformations; those relative to life, which are evidently established to preserve and perpetuate it in all its modes, we ought to conclude, are calculated to effect their object with equal precision. Not that the argument rests, in its present form, on analogy solely: there are parts of it as plain to our apprehension, and as evident to our senses, as a mathematical demonstration; and these are so numerous as to leave, probably, less to be resolved by analogy than in any other department of experimental science. Nothing, indeed, is so left, if, instead of attending to those ramifications of the subject which, perhaps, no finite being is capable of completely unravelling, we come at once to the final result, that moral, nay physical demonstration, which is as manifest to our feelings and to our senses, as that the sun, shining in his meridian strength, suffices to illuminate and to warm the world.

(19) Looking, therefore, to the universal operations of Nature, a direct negative seems abundantly sufficient wherewith to meet the daring assumption that there is a tendency in all animated beings to exceed the means of subsistence; or, in other words, the charge against the First Great Cause, that he has been "profuse in showering abroad the germs of existence, and parsimonious in providing for their support." But in a time like the present, when principles are becoming popular which heathenism itself would have spurned with abhorrence, it cannot be superfluous to retrace some of the arguments which have settled the opinions of the wisest and best of men in opposite conclusions; and, as I have to meet assertions which have never before been hazarded, it is not improbable but that some of the arguments may be such as have not heretofore been urged, even on a subject so familiar to mankind.

(20) Addressing myself, then, to those who believe in a Deity; if I prove that it is in the contemplation of that Being to balance the numbers and food of his offspring, and that he has plainly manifested that intention, then I assert that the food and numbers are balanced. None can doubt that, if this intention be proved, it will amount to a moral demonstration of the highest order, which none, indeed, but the atheist will attempt to resist. But, agreeably to modern phraseology, though con-

trary to that of the greatest philosophers that have ever yet existed, if I refrain from using much the name of the Deity, and substitute that of Nature (which, however, without reference to its Author, has no meaning, and, with it, is a mere pleonasm), the argument may be thus expressed.

(21) *First.* Nature has calculated with the utmost precision, and unalterably settled, the different degrees, as well as periods, of prolificness in all things living; obviously varying both, with reference to the means of sustentation. The presumption, I might say certainty, therefore is, that the laws of reproduction do not tend to excessive increase, but are precisely regulated by those means.

Second. During the process of reproduction, and through the early stages of existence, Nature guards with peculiar art, and defends with the utmost care, "the germs of existence," as they are denominated in the theory I am opposing. The presumption, therefore, is increased that those "germs" are, in no just sense of the term, superfluous.

Third. It is the plain purpose of Nature, indicated by an infinite variety of means, which are in perpetual operation, to sustain her animated offspring when matured. The presumption is, that she is not defeated in that her intention, and consequently, that the numbers preserved are not superfluous.

Fourth. Not only are those necessaries of subsistence, and the means and instruments by which they are obtained, bestowed on all living beings, but, at the same time, facilities of escape or defence are conferred upon each, which preserve that existence as far as is compatible with those plain intentions of Nature, which will be hereafter adverted to. The purpose of Nature is, therefore, preservation; numbers then, in her estimation, are not superfluous.

Fifth. The very means of subsistence, especially those consisting of prey, when duly considered, are in themselves the proof that numbers and food are, and must necessarily remain, perpetually balanced and adjusted to each other: numbers, therefore, compared with food, cannot be superfluous.

Lastly. The whole of animate creation, through all its tribes, especially when far removed from human interference, abundantly demonstrates that life and food are in due proportions; or, in other words, that existence is connected with enjoyment.

that universal misery is not thrown into the scale of being by that hand that created both numbers and food, and sustains the balance in an everlasting equipoise. Numbers and food are, therefore, balanced.

(22) Premising that those accidental sufferings, which are needlessly and voluntarily inflicted upon the animal creation, for which those who perpetrate them will not be held guiltless, are not chargeable upon the laws of Nature, any more than is the fall of an unprotected infant upon the principle which sustains creation,—attraction; and also, that the charter of Nature, by which man feeds upon animals, and animals themselves upon others, is not to be regarded as an evil (in proof of which more hereafter); I proceed to observe that the proportions in which the animal tribes multiply are one great proof that their numbers are regulated to, or balanced by, their food.

(23) *First.* That law of Nature which varies the prolificness of different species of animals so extremely, and still, at the same time, preserves that prolificness in the same species in so near and surprising an uniformity, is of itself, I think, a satisfactory proof of the first point. The fact being of such settled and perpetual occurrence is too common, perhaps, to excite much attention; but, if we consider the reason, it is obviously in confirmation of the principle for which I am contending.

(24) Let such as doubt this attend to the converse argument, and how little soever the former observation may be deemed worthy our consideration, the latter will, I am sure, be allowed due weight. Let this law, which regulates and fixes so exactly the measure of prolificness in each tribe, be relaxed or reversed, and let the larger animals, for instance, be endowed with the fecundity of the smaller ones, and these again with the comparative sterility of those (which, *à priori*, would have seemed to human creators far the most reasonable regulation), and what then would have been the consequence? The evil in the principle of population, now a matter of bookish speculation on the part of those who assert it, and denied by mankind at large, who appeal, in behalf of their better principles, to the order and happiness of the universe, would indeed have been a truth of the plainest and most tremendous nature;—the sentence would have written in characters of dismay, *Tekel*, on the balance of food; it would indeed have been

found wanting, but the period of suffering would have been cut short. So, to change the measure of animal fecundity, would dispeople the universe in a day!

(25) But perhaps there may be those that believe that Nature makes a sort of blind and blundering attempt to regulate the numbers of her offspring, with some view to their sustentation, though she has not hit exactly on the correct proportions; and this notion, suggested by human ignorance, however concealed in unmeaning phrases, is positively that which is held by many, and is the very one I am combating. Allowing such their prosopopœia, which shifts from the Deity the charge of creation and places it in the hands of Nature, what does the idea of Nature being "lavish in the germs of existence, and sparing in their means of subsistence," imply, but that she accomplishes her purpose, like some ignorant and bungling workman, who has to make more of the articles he fabricates than will be wanted, in consideration that so many will be spoiled in the manufacture? To fix in the mind a more just idea of the precision with which she makes and carries into effect her calculation, is the purport of these remarks.

(26) In most of the terrestrial animals with which we are sufficiently acquainted to judge of the fact, the period and term of gestation is fixed, and the degree of prolificness constantly determined by physical causes over which themselves have not the least control; we ought therefore reasonably to presume that prolificness to be right. That it is so, is still further confirmed by another class of beings, probably many thousand times as numerous as man, in which the degree of prolificness seems to depend on an act of volition, indeed on a discretionary power; so governed, however, by instinct, as to produce effects in all probability as precisely uniform as those which are regulated by physical necessity: I allude to birds. Left undisturbed in the business of reproduction, they conform, through all their tribes, to the laws of Nature, in regard to the different numbers which each reproduces, and with as much certainty and regularity as those animals the prolificness of which, as has been before observed, is differently regulated. But the ovarious state of their future offspring, exposing the measure of their reproduction to accident and depredation, far more than any other mode observable in nature, they are endowed with a strange and

not very comprehensible power of supplying such losses before incubation. They can do more: if their nest be taken during that period, or their whole brood destroyed previously to their maturity, (when with them the parental office ceases,) by the same physical faculty they can repair their loss, and even repeat, at later periods of the season, the whole process; few, therefore, if any, are the instances in which Nature is frustrated in her intention of producing the numbers on which she has determined, and for which, I say, therefore, she has provided. They are for this purpose gifted with a sort of natural arithmetic, which informs them of their right number, and are compelled by a powerful impulse, perfectly distinct from the originating one, to adhere to it, however interrupted; and for this very purpose they are endowed with a physical capability of which we can have little idea. Every juvenile depredator upon their beautifully-formed and surprisingly-varied nests, knows all this as well as the profoundest philosopher. Dr. Lister informed the celebrated Mr. Ray that he himself had abstracted as many as nineteen eggs, one by one, from the nest of a swallow, who, unsuspicious of the theft, had supplied the loss daily. Again; "If," says Lord Bacon, "you take the "eggs or the young ones out of the nests of birds, they will fall "to generate three or four times, one after another." He might have added that, when they become aware of the interruption, they will change the scene of their operations, so as to increase the chances of effecting their purpose in greater secrecy and security. So intent, therefore, is Nature on accomplishing the precise number she contemplates to reproduce in this incalculably numerous class of her offspring, as thus to countervail, by powers and instincts perfectly incomprehensible to us, the minutest interruptions in her operations. Can any one, then, bring himself to believe, for a single moment, that that number is not the right number?—right, especially, in reference to the means and measure of subsistence, without which it would be wrong indeed!

(27) Having illustrated the present branch of my argument by a more particular allusion to this beautiful and numerous tribe of creation, let me conclude it by inquiring whether the intentions of Nature, in thus varying their prolificness with a view to their sustentation, are accomplished? Does this need

an answer? In the language not less of philosophy than of divinity, we may exultingly appeal to these, so peculiarly exposed to all the evils of excessive reproduction, had there been such a malignant principle in Nature. "Behold," then, "the "fowls of the air, they sow not, neither do they reap, nor "gather into barns," yet the universal Parent "feedeth them." Sparingly, partially, uncertainly, as the system I am opposing maintains?—No; but by anticipated provision, infallibly certain, and abundantly sufficient,—so that they "sing among the branches."

(28) On the whole, I think it clear that the variation in the reproductive powers of animal creation is a plain indication that Nature has calculated this point, and intends to preserve the necessary balance of numbers and food; and that it is thereby preserved, is further manifested by all experience.

(29) *Second.* That the germs of existence are not redundant, as now represented, I prove from the care which Nature takes to preserve them in existence, and to bring them to maturity. In this office, she seems more sedulous even than in that of mere regulator of the numbers of the different species; and as to her having been very sparing in the provision necessary for them, the reverse of the assertion is the obvious truth. It would be difficult, I think, to write a single page in proof of such a notion; whereas countless volumes have been composed to show the plenty in which all her offspring luxuriate. At present, a thought or two shall be devoted to the subject of the surprising care which she visibly takes of all those germs; arguing little in proof of that prodigality, on the one hand, or penuriousness, on the other, with which she now stands charged.

(30) We may first notice the extraordinary tenderness, the constant protection, which Nature displays, in regard of the parent existence, during the period of gestation; the additional security with which she then invests life itself (an interesting fact, perfectly familiar to physiologists); and, especially, the variation in the entire process of reproduction, when safety seems to demand such deviations. To give a single instance of this. The process is changed into incubation in the case of birds, who would otherwise, under such circumstances, be incapable of flight, and, consequently, be both themselves and their offspring exposed to certain destruction; while, as it

respects those powerful and majestic animals which, at such times, are fully capable of defending themselves and their offspring, Nature seems to confide to them that duty,—which few that value existence will rashly interrupt. But it is to her care of the more weak and defenceless tribes that I would especially advert. The security which such seek from those enemies, and those only to which they or their offspring are exposed, is singularly varied in its means, yet all point at the same end. Situations inaccessible to attack are selected, or artificial guards are interposed; or places of concealment are chosen, or, where there are none, dexterously formed. To advert again to the feathered tribes, as that class of beings which, among those little liable to our interference, is the most obvious to our notice. When the work of reproduction obliges them to become stationary for a considerable period, what infinite address do they exhibit in accomplishing their purposes, particularly that of security! Some of these choose the loftiest trees of the solitary wood; and, lest the tops of these, where there is commonly the greatest luxuriance of foliage, should not sufficiently secure their nests by concealment, they generally build on the most tapering branches, the thinness of which affords additional safety. Others, which seem to affect human society, build on the pinnacles, or beneath the battlements, of our loftiest edifices, always, however, out of the reach of general molestation. Some choose the shelves of inaccessible precipices, or the crevices of rocks that hang beetling over the ocean; others peck their retreat into the centre of trees, which they know well how to select for that purpose; others, more obvious to common notice and constant interruption, nevertheless accomplish their ends with scarcely less cerainty and security, though by very opposite means: they have to fix their nests in situations perfectly accessible and near to view; but, by a countervailing provision of Nature, they so assimilate them in colour and appearance to the boughs in which they build, or the mossy bank in which they are imbedded, as to render the security from such artful concealment as complete, probably, as that from apparent inaccessibility. I am tempted to notice the admirable fitness, in shape and size, the exquisite beauty, and the marked and striking variety in these transient receptacles of infant life,—the extreme rapidity of their construction, with the one simple instrument employed (the beak), increasing the wonder,—but I refrain, as not strictly bearing on my subject. I shall therefore proceed to remark, that the still minuter and infinitely more numerous oviparous beings are not less instructed how to deposit the seeds of their future progeny; whether they inject their eggs deep into some solid substance, by means of instruments adapted for that special purpose, which excite the admiration of the minutest observers of nature; or fix them, by some glutinous fluid with which they are provided, where they will be least exposed to observation or injury; or securely deposit them, in a variety of other ways familiar to the naturalist, till the moment they are vivified by influences, and sustained by means, totally distinct from the parental principle.

(31) But I must not here wholly pass by that strong feeling of parental solicitude with which this unprotected period of existence is strictly guarded. If Nature has reinforced, as it were, the parental constitution during the period of gestation, she has equally increased the fearlessness, the solicitude, nay, I may add, the sagacity, by which its progeny is preserved The means of defence and sustentation equally excite our admiration. The one inspires the parent, not only with a preternatural courage, but with a self-devotion, which, in the humblest example, would amount to a voluntary immolation in behalf of the offspring; the other invests it with a generous disregard of personal privation and suffering which realizes the fiction of the pelican. For these mingled feelings the Greeks had, in their emphatic language, a single expression, *ςτοϱγη*: to which a sagacity almost miraculous may be added, as completing those instincts by which Nature preserves infant life. That this extends not a moment further than the necessity exists, to meet which it is called into existence, is fully obvious, as applied to the whole of animal creation. Thus, though the last act the parent bird has to perform for its offspring is, perhaps, as affectionately and as anxiously discharged as was the first, still, after that impulse, by which

> —— the bird each fond endearment tries
> To tempt its new-fledg'd offspring to the skies,

is obeyed, and is successful, all that solicitude, affection, and care cease at once and for ever. Not so, however, (may I be permitted so far to digress?) is it with the human race; higher purposes are in that case to be effected by this sacred feeling; which, while it feeds all the charities of life, knits the different, though contemporaneous, generations in those mutual bonds of affection which constitute the happiness and secure the interests of the species.

(32) There are, however, numerous tribes of beings in which this efficient preservative of early existence, parental affection, is totally wanting. Mark, then, the case as it respects these: instead of breaking the analogy of my argument, they add to it a strength and continuity which nothing else could supply. They prove, that however Nature may vary her methods, her end is invariably the same. Has she, then, deserted these orphans of creation, if I may so denominate them? and the query concerns many of her most numerous classes. On the contrary, it is in behalf of these that she manifests a redoubled solicitude. She prescribes that, in such cases, the parent shall anticipate its cares, and deposit the embryo of future existence in precisely the proper situation, and at the proper period; when the atmosphere itself shall perform, if I may so speak, the work of incubation; and the unprotected being shall waken into life at the exact season, amidst a profusion of sustentation adapted to its use, provided by another world of existences, namely, the vegetable kingdom, subject to laws as complex as those that govern the animal one, and plainly subservient to it. Here, then, it meets its abundant supply till it wings its way to reiterate, in its turn, the miracle of its own birth. Here the naturalist must be well aware how the subject might be illustrated by examples of the most interesting nature, whether from the triform state of insect existence, or the more simple process of reproduction which prevails in other tribes of life; but I forbear: for, tedious and lingering as the subject may appear in my hands, my effort throughout is at compression, and my aim to confine myself to a mere popular and synoptical view of the subject.

(33) But all this ample provision; all this jealous circumspection; all these concealments and defences which Nature has thrown around initial existence, if I may so ex-

press myself, do not still satisfy her. She is bent on her work of preservation. After all her solicitudes, the period of infancy, with regard to the animal tribes, is still the period of peculiar danger. Finally, therefore, she shortens that period by a rapidity of growth to which there is nothing corresponding in human beings; bringing them, as it were, to a sudden and almost miraculous maturity, and thus lessening the danger of that state by diminishing its duration. I say, almost miraculous, upon any common principles; which any of us may speedily verify, if we weigh, from time to time, the growth of an unfledged bird, for instance, which has just burst from its shell, with the entire weight of what it receives.

(34) I shall pursue these branches of the argument no further; but conclude by observing, that the exactness with which Nature prescribes the measure of prolificness throughout all animal life, and the astonishing care with which she guards the germs of existence to their maturity, are full proofs that their numbers are in no imaginable sense superfluous: even the seeming exceptions to the foregoing proofs will, on due consideration, rise into additional illustrations of the same universal truth; and as such will be adverted to hereafter. I may, however, here pause a moment, to notice an objection which may possibly be raised against this branch of the argument, founded on the circumstance of some of these "germs of existence" being, before vivification, the food of different orders of animals; for instance, the spawn of fishes, as well as the eggs of birds, it is well known, furnish sustenance to some others in both their respective elements. But this fact, instead of constituting an exception to the general principle contended for in this essay, is wonderfully confirmatory of it. It extends the analogical, or rather it strengthens the direct proof advanced; by exhibiting Nature in the very act of balancing, even by anticipation, life and food, and still by means that multiply vitality. To trace this particular subject would form, indeed, a most interesting part of the entire demonstration, and its proofs and illustrations are at hand. We must, however, in this, as in almost every other instance, merely suggest it for consideration; nor can it be necessary to shew that these "germs" cannot, at any rate, be superfluous. That man

consumes eggs, is surely no proof that either eggs or chickens are redundant.

(35) I proceed then to shew, *Third.* The visible care which Nature still takes to sustain all her offspring when she has conducted them to maturity, and consequently when they make the largest demand upon her resources, is a full proof that they are not in redundant and excessive numbers; that the balance of these and their food is still preserved. In the very front of this branch of the argument, and as infinitely the strongest of its proofs, I would again appeal to the plain intention of Nature, or, to drop for a moment the unmeaning personification, the Deity, to sustain all creatures. It is here that not only his essential attributes, but his very being, have been recognised, even in the darkness of Pagan ignorance and superstition. Rousseau ridicules Nieuwentit for having written a voluminous work to demonstrate, what he says was never doubted, the universal benevolence of the Deity. If this, however, be seldom doubted, it is often forgotten; nay, in the theory I am opposing, it is boldly denied. This theory maintains that the Deity has created more living beings than he cares to sustain; and that the consequences of this excess are misery throughout all existence, and, as respects human beings, vice added to and embittering that misery. Were the fact true, the conclusion is inevitable; and both would, in the apprehension of mankind, disrobe Him of that essential attribute in which they can best regard and alone approach him,—his goodness: with which not all the labours of metaphysical divinity, spinning its arguments as fine as cobwebs in the night of its own understanding to the dawn of eternity, could reinvest him!

(36) Let us therefore take a momentary view of the eternal Pan, in providing for the people of his boundless pasture. But what a subject! how vast in its extent! how infinite in its parts! All the elements, the various seasons, the different climates, the whole vegetable and animal kingdoms, are alike involved in it; all these, by known and perpetually operating laws, furnish their quota to the great storehouse of existence, in which the miracle is equal, that the supply neither fails nor exceeds, and all is so adjusted, that, in this infinite variety, there is no confusion; in this eternal plenty

there is no superfluity. Let us attempt to trace, with feeble steps indeed, but still directed towards our subject, some of the direct indications that it is the intention of Nature that this provision should be fully and fairly shared by all her living dependents.

(37) And, first, it is interesting to observe how carefully she provides for the weakest of her tribes; on these, like all indulgent mothers, she still seems to bestow her tenderest cares. After having endowed the larger animals with a sufficient degree of voraciousness, and with a very observable jealousy of their peculiar food, even beyond their instant wants, how does she provide for the former? Simply by diversifying the instinctive appetites of the different species, which has the effect of preventing the monopoly of the means of existence by the ferocious and the strong, and of evenly distributing her bounties, and providing against an undue demand being made upon any particular kind of them. In the refectory of Nature the different species have their separate seats and their distinct messes, which, though perfectly agreeable to themselves, the rest refuse to occupy or to touch: and thereby the harmony and plenty, which, among such various and unnumbered guests, would otherwise be constantly destroyed, is as perpetually preserved.

(38) It is furthermore observable that, as the food of several of these tribes varies with the change of the seasons, and sometimes of climate or situation, their appetites are adjusted to these vicissitudes; but still those appetites are kept as distinct as before, so that the food of Nature, which, in the change of seasons, may be diminished, is still duly distributed.

(39) But, without being minute, it is still necessary to observe, that the food of whole classes of animals almost totally disappears during the more rigorous seasons of the year. If ever there is a time wherein to demonstrate the superfluity of numbers, this must be the one. But does Nature abandon them then? By no means. Those that cannot change their food, as before remarked, are compensated by physical, I might almost add by mental, capacities which effect the same benevolent purpose.

(40) Look at that inconceivably numerous class of beings,

which reflects the foresight, and indeed forms the interesting exemplar, of mankind,—the ant. In the season of universal profusion, exercising a prescience with which Nature has endowed it for that special purpose, it treasures up the superfluity it finds, wherewith to supply its wants during the barren and rigorous season which succeeds; storing it in places of the greatest security; and, by some process which has hitherto escaped the knowledge of naturalists, though it has long exercised their curious conjectures, preserves it;—grain, for instance, in the bosom of the earth, without sprouting or being spoiled. Exactly similar instincts, and for precisely the same purpose, are found likewise in other of the animal tribes.

(41) Where, however, Nature does not think fit to use these means, she still accomplishes her end by others: some creatures, therefore, during this season, she renders capable of a long inedia: others, by laying them to rest during the unpropitious season, just on the same principle as she disposes of us and almost all animated nature, when she diurnally withdraws from us that light so necessary to our active existence: and, lastly, as respects infinitely greater numbers she limits the period of life to the propitious season; sometimes, indeed, to the shining hours of a single day. That these have an essential office to perform, which closes with the season and their life, it would be little difficult to shew; that they are too numerous for the purpose, would be less easy to prove; and that they are not adequately sustained while they are discharging it, which is the point at issue, hardest of all to demonstrate, as it would contradict the evidence of our senses.

(42) But of all the demonstrations of the intention of Nature to provide, under varying emergencies, for all her creatures, that which is called migration is the most striking; an instinct by which she instructs numerous tribes in both elements to perpetuate, as it were, the fruitful seasons, by pursuing their cycles over the habitable globe. Many more, even of the quadrupeds, are naturally migratory than is popularly known; especially in our insulated country, or even in those parts of the earth where the population presents artificial obstacles, and, as it respects them, insuperable to the habit, however strongly impressed. That many of the fishes are so, is abundantly proved: but I shall confine myself to another order of beings, the same so

often referred to—the birds—as most obvious to our notice. What does this inexplicable faculty imply, as it regards these? First, it implies, literally speaking, a spirit of prophecy. At the very period when their food abounds (for it is essential to the purpose that the flight should be undertaken while they are in full vigour), they foresee the coming of the unpropitious season. Nor is this indicated by the change of the atmosphere solely: it has happened that, where the season has not corresponded with its usual period, still the latter has been punctually adhered to, when thousands of them have perished, as the savans of France have more than once recorded of the most exact of the migratory tribes, the swallow. Secondly, they have a mysterious, but a certain, knowledge of physical geography, and know most accurately where the regions lie to which they proceed, which the greater part of them have never previously beheld, but where, nevertheless, they are assured of the provision that awaits them. They assemble, therefore, and, departing at the appointed moment; they pass over an extent of land, or an expanse of waters, where, if they had guides, there can be no objects of direction; a distance in which sight can avail them nothing, however acute; where night overtakes them in their career,—yet still they persevere in the right direction; and, by a muscular exertion scarcely less wonderful than all these miracles, and for which nothing can adequately account, and with a certainty without any parallel in human affairs, they accomplish their astonishing purpose. I know not whether it can increase our wonder to be reminded that all this is effected without either experience, instruction, or example; for the same thing would occur, and has so done, in regard to a brood that has been artificially hatched, and let loose just after their unseen kindred had commenced their career.

(43) But let us observe how this migratory instinct is regulated, as it respects those who are subject to its influence, with a view to their sustentation: so that the balance of life and food seems to be preserved throughout all the habitable world. When Nature gives the mysterious intimation that her bounties are about to be withdrawn from one region, she infallibly invites the wandering subjects of her care to another; and her expected guests arrive at the precise moment when, by a long and diligent process, she has spread her table for them. But

it is to be remarked, that, as these withdraw, others succeed, for whom a different entertainment is prepared ; so that her table is always full. It is thus that, from the first of time, " the stork in the heavens hath known her appointed times, " and the turtle, and the crane, and the swallow, have observed " the time of their coming."

(44) To conclude this branch of our argument, and to prove how staunchly Nature pursues her purpose of preserving existence in every possible form, and sustaining it in every imaginable manner, making, to use a familiar but a very emphatic phrase, the most of her means, vast as they are ; let me point to an order of beings, which, perhaps, like many others, answers a multiform purpose, at least, enjoying existence themselves and securing the enjoyment of it in others. In all that I have asserted respecting the care which Nature takes to support life, I have never said that it is her intention to support it in perpetuity. The real check of numbers is death ;—I mean death placed at that distance from the commencement of life, which divine Wisdom has so variously determined and ordained throughout animated nature. Considering how vast a mass of that life which pervades our universe, even after the portion of it is abstracted which becomes the prey of its different orders, is constantly extinguished by death in its natural form, who could describe the consequences of such incessant mortality, were it not for a provision of Nature to which I am about to allude? The plagues of Egypt form an inadequate picture of the pollution to which this would doom the earth, till its effects would become universally fatal. To remedy this, Nature has provided numerous and diversified classes of animal undertakers, if I may use so familiar an illustration, who remove all these otherwise insufferable nuisances, by consuming them. How soon this is done, as it respects the large as well as the smaller relics of mortality, and by what processes, I need not here explain. One thing, however, I will mention ; in that season when part of those troops which Nature commissions for this special service are absent, she remedies or circumscribes the nuisance by the antiseptic qualities of the atmosphere ; in fact, preserving it therefore for those of her tribes which are the scavengers of creation, and which she evidently employs and feeds in the different seasons of the year as she

wants them. It is very observable that, as these have not to contend with their prey, they are, generally speaking, the smallest and most feeble part of animated beings; but, in number, they probably far exceed all the others which are hitherto open to our observation. That that number, whatever it may be, overbalances their food, would be indeed a monstrous supposition. It would be to imagine that, seeing the necessity, and attempting to provide for it, Nature has made so false a calculation, so bungling an attempt, as to increase the nuisance by the very means she has taken to abate it.

Thus, as is well said in a celebrated work on general science, "It is of importance to observe, that in the water as well as on "the land, Nature has nicely adjusted the balance of destruc-"tion and renovation, thus providentially guarding against an "overwhelming accumulation of putrid carcasses, and multi-"plying, at the same time, the sources and centres of vitality "and animal enjoyment."

(45) Enough, I hope, has been adduced to prove that Nature is as visibly engaged in preserving the numbers she has conducted to maturity, as she is in determining those that shall be brought into existence. I do think that much more, advanced in support of this view of the question, would be superfluous: having, however, prescribed to myself a certain train of argument, I must proceed to the consideration of the remaining points. I proceed, therefore, to shew that,

(46) *Fourth.* The means and instruments by which food is obtained, are such as seem to indicate the certainty of its supply. Leaving out of the question those animals whose strength and swiftness give them a command over the provision destined for their use, the others obtain it by a sagacity, an ingenuity, or cunning, which, for similar purposes, the human race may imitate, but can never equal. The provision is thus rendered certain: but we mistake if we think that the obtaining of it absorbs the sole and anxious care, especially of the animals of prey; or that, in a state of nature, their depredations on the inferior tribes are great, in proportion to their numbers: of which more hereafter. That no unnecessary and wanton havoc should be committed on the various orders of beings, Nature has, however, taken care; by investing each with pecu-

liar modes, either of escape or defence, corresponding to those of attack before alluded to, and quite as wonderful. These respectively form some of the most curious and interesting observations which natural science suggests, and may be traced through the entire tribes of animal creation, descending down to the very insects, and as having the strictest relation in all cases to each other. I shall not attempt to enumerate them; though I am well aware that even a single instance would have a stronger effect, and be deemed a more substantial proof to the unpractised mind, in favour of the argument I am pursuing, than a whole volume made up of these general observations. The end, however, of Nature, is fully answered; none are deprived of existence, but such as are required to resign it to preserve others; and few, I think, will denominate such superfluous in the scheme of creation. But this brings me to the succeeding branch of the argument, namely,

(47) *Fifth.* The very means of subsistence, especially those consisting of prey, are, when duly considered, proof in themselves that numbers and food are, and must ever remain, accurately balanced.

(48) I shall spend very few words on those tribes of animals, the food of which is apparently of a vegetable nature solely: they are far less numerous than is commonly supposed; and that these, at all events, do not exceed their means of subsistence in a state of nature, the almost untouched, certainly unexhausted, resources of the vegetable kingdom manifest.

(49) As to those more numerous tribes of beings whose food principally consists of living substances, and which may therefore be denominated animals of prey, before I proceed to shew that the numbers and the food of these are, and must necessarily remain, balanced, I will claim the liberty of a short digression, more consoling, indeed, to the feelings, than necessary to the argument, with which, strictly speaking, it has no essential connexion; in which I shall shortly prove, that, whatever be our first impressions on the subject, this branch of the economy of Nature is as replete with benevolence as any of the rest of the laws of creation.

(50) And first I must remark, that the successive renewal of life throughout the whole of creation, thus swarming with existences, by the intervention of death, is, as it respects all but

the first and original race of beings, an ordinance of benevolence, and unless the laws of Nature were suspended or reversed, to those likewise; continuing, indeed, the blessing of existence while it can be enjoyed, and when no longer desirable, transferring it to successive myriads of participants; preventing therefore at once a monopoly of the pleasures, as well as a perpetuity of the increasing miseries of existence.

(51) None, however, I think, are wild enough to imagine a scheme of nature in which the animals should be immortal; and, if otherwise, I think it would be difficult to prove, their condition duly considered, that the removal of those which become the prey of others is more distressing than that of such as die what is called a natural death, which, as will be shewn, is a rare case among them, and happily so; as in their instance it would be one of lingering disease and increasing weakness, terminated often by the most dreadful form of animal suffering, actual famine. In the mean time the principle of self-preservation, implanted in them by Nature, may perhaps inspire them with a fear, or rather caution, respecting their enemies; but it may be doubted whether this approaches to constant or painful apprehension; nay, whether it amounts to any thing like the occasional disquietude which human beings feel in respect to their last enemy, whose final triumph they know to be certain, and cannot but anticipate, and which often forms the bitterest ingredient in the cup of human suffering. From this feeling the inferior animals are entirely exempt. Up to the very appearance of danger their fears are not excited, and then its duration is, generally speaking, too short to admit of distinct perceptions of suffering. Instead, therefore, of having life embittered by strong apprehensions, or pursued by relentless diseases, to the last it seems to them a scene of pleasure, as the poet sings of one of the loveliest victims of the master animal of prey:

> Pleas'd to the last he crops his flowery food,
> And licks the hand just raised to shed his blood.

But, if habitual caution among many of the tribes of life is, however, excited by the circumstance of their being the objects of prey, it calls into action those facilities of escape and means of defence with which all are endowed, the successful exercise of which inspires that sense of conscious security, which, no doubt, administers to their happiness, as it does, under different circumstances, to our own.

(52) Moreover, familiarized as we are to slaughter, we are, perhaps, ready to transfer our ideas of this mode of sustentation far too largely to the animal creation. I am inclined to think that we mistake in imagining our world to be a kind of immense slaughter-house. Beyond a certain proportion this evidently is not the case; and that proportion, in all probability, will seem smaller, compared with the whole, the more closely we consider the subject. The expression of an author I have all along in my recollection, that of animals "preying upon each other," is capable of a very erroneous interpretation, and, as respects the subject under consideration, leads it to a very false conclusion. Scarcely any species of animal preys upon its own kind; from such a mode of subsistence nearly all rigidly abstain.

(53) Pursuing this idea as we ought, we shall find that it will almost entirely divest that part of the system of Nature under our consideration, of its apparent terrors. Look where we please, whether to the tribes of earth, air, or ocean, those creatures of prey, which are the objects of dread to those on which they feed, are, compared with the latter, in point of prolificness, sterile; and in point of numbers few: they are then, to such, rare and solitary beings, and the amount of their depredations is accordingly limited. I mean not to confine this observation to the ferocious monarchs of the various tribes, with whom this is obviously the case, and has been often noticed; but down through all the descending links of carnivorous animals, it holds as strikingly true. The shark is as rare a monster to the cod, as the cod is to the herring; the depredations of both, then, must be limited indeed, compared with the numbers of the entire class. For example, much as game is destroyed in this country, still, probably for a single hawk, there are a thousand partridges; and for a single partridge, ten million ants. Different classes of beings may, indeed, prey upon the same tribe; but still, all the former united, will always be found little numerous, compared with the latter. Thus, though the spider commit devastations upon the same species as the swallow, the numbers of both these are as nothing, compared with those of the flies. Indeed, the minuter, and, as it ap-

pears to us, the most defenceless beings, seem to form a sort of life-assurance company amongst themselves, moving together in multitudes, and consequently, the individual risk from weakness and exposure is reduced to almost nothing. The shoals in which the smaller fry of the waters always move, and the clouds in which insects congregate, may illustrate what I mean; not that these associations may not have other purposes, and each individual distinct means of defence, or rather escape, some of which should be particularized, had we opportunity.

(54) On the whole, then, it is not beyond the scope of possibilities, nor can I think it very unlikely, that those devastations in nature, over which we profess to mourn so much, are, in comparison with the immense numbers exposed to them, the reverse of numerous, possibly indeed not so common as those premature deaths, from whatever cause, to which our own species is so subject, but from which theirs are almost wholly exempt.

(55) If the preceding views be just, it is probable that most animals in a state of nature survive through the period of their health and enjoyment, and that their decline then is almost as instantaneous, as we have noticed was their growth; when, to spare them the most cruel of deaths that must otherwise await them all (that of solitary suffering, terminated by famine), a numerous class of animals before alluded to, distributed through every element, are commissioned to put an end to their sufferings; whose prey they become. Nature, therefore, in this, as in all other of her operations, acts upon a principle of kindness, and rescues such from a far more acute degree of suffering, than that from which a kind master frees a faithful quadruped, its period of enjoyment over, by a sudden and easy dismissal. Nay, we observe this instinctive propensity to terminate sufferings, when the animals of prey are absent, and consequently the impulse of appetite can have nothing to do with the act; thus notwithstanding the short-sighted speculations of ignorant man, perhaps the deer which joins in concluding the miseries of a comrade he cannot relieve, acts upon a law, impressed by Nature, grounded on substantial kindness.

(56) The preceding remarks have, however, little to do with the subject in hand, the balance of food and numbers.

I have been betrayed into them, while attempting to vindicate the ordinations of Nature from involving that universal misery which an insufficiency of the means of subsistence implies; by a feeling of repugnance to recognize any principle of peopling and supporting animal creation that is not placed upon the solid foundation of universal benevolence.

(57) So much, then, for the alleged cruelty of Nature in comprehending prey among the means by which she subsists her universal family. But whatever doubt there may exist as to whether the sum of individual happiness is increased or diminished by this regulation, there can be none whatever but that it almost infinitely increases the numbers of its participants. No supposition ever hazarded could be more at war with both facts and possibilities, than that this law of Nature was intended for the purpose, or has the effect, of repressing the superabundance of animal increase,—as asserted by the author frequently alluded to. If there be any one point more clear and certain than another in the economy of Nature, it is that, by this very principle, the sources of vitality, as well as the means of support, and consequently the numbers of living beings, are increased by it to an extent wholly incalculable, and otherwise impossible.

(58) Between our own animal nature and that of the lowest grade of existence, which is, in all probability, far too minute to be ever obvious to the human senses, however assisted, and which may perhaps be supported by vegetable matter, or indeed by something far more subtile; as it is clear, from late experiments, that, under certain modifications, life can be supported without food derived from any tangible substances;—I say, between man and that lowest being, whatever it may be, what innumerable gradations of life are interposed! —most of which (and, considering their intimate connexions, probably all) would disappear, were the supply we are now considering, namely, that derived from animate matter, withheld: and if nature were to be repeopled with creatures adapted to such a change, the earth would become a comparative solitude. But, constituted as nature now is, it is hardly possible, strictly speaking, to say what order of animals is not carnivorous. We greatly err respecting those we commonly deem otherwise; the ox, for instance, probably devours more

living beings in a day than a human being is conscious of doing in his whole life. Nor is there any way open of escaping this necessity, even to man, however anxious he may be to avoid it. The hermit may, indeed, please himself with the idea of sparing the animal creation in his simple repast, concerning which our inimitable pastoral poet, Goldsmith, the lover of animals, as well as their historian, makes him exclaim,—

> No flocks that range the valley free
>   To slaughter I condemn;
> Taught by the Power that pities me,
>   I learn to pity them!
> But from the mountain's grassy side
>   A guiltless feast I bring;
> A scrip with herbs and fruit supplied,
>   And water from the spring.

But alas! for the beautiful illusion, Leuwenhoek tells him, that every drop of that element soon swarms with myriads of aquatic beings; and St. Pierre, that upon one of the simplest of the fruits on which he is feeding, the strawberry, there are innumerable multitudes of another description; even on one of its leaves immersed in the deleterious atmosphere of Paris, that interesting writer, by the aid of a very common microscope, discovered thirty-seven different species of insects. I cannot but pause to remark that his observations and deductions, though consistent with the severest truth, are, nevertheless, far more brilliant than the most exquisite creations of the imagination; and unfold to us the overwhelming idea of a single vegetable accommodated, in its various parts, to the organs and uses of countless numbers of sentient beings; and becoming to such, therefore, a world sublime in magnitude, beautiful in variety, and overflowing with plenty.

(59) Man, therefore, conforms to this law of nature; but in doing so, to advert to a preceding view of the subject, (and I shall again notice the pleasing fact,) he at least, beyond all doubt, increases the happiness, as well as multiplies the numbers, of those animals which he selects for that purpose.

(60) Having premised thus largely, I shall return to the proposition with which I commenced, namely, that the law of Nature which makes one order of animals the food of another, affords in itself a full disproof of the assertion, that there is

in all animated life, a tendency to increase beyond the means of subsistence that is prepared for it, and yields, on the contrary, a satisfactory demonstration that numbers and food are and must remain duly balanced. So clear is this truth, indeed, that I should have included it amongst the arguments evidencing the particular providence and foresight of the Deity, with which it plainly classes itself, only that it is regarded in so different and peculiar a light by those who hold the notion of a superfecundity in animal creation, as to demand a separate and distinct consideration.

(61) How stands, then, the notable axiom, in regard to these animals of prey, that "there is a constant tendency in "all animated life, to increase beyond the nourishment pre-"pared for it; which, as it respects animals, is repressed by "their becoming the prey of each other?" No lengthened exposition can make this proposition, as it respects animal creation, more absurd than it appears to be at first sight. It positively asserts in one breath, that the number of animals is excessive in relation to their food, and their food excessive in relation to their number. Had it been asserted that certain species of carnivorous animals were over prolific in reference to others, the argument might be tenable at the expense of the perfections of the Deity, and by denying the evidence of our senses; but to maintain that they are all so, is a contradiction in terms. What kind of system is that of Nature, according to such authorities? One made up of a strange mixture of ideas, some of them the most horrible, others the most ridiculous. If I had the genius of Æsop, I would describe it. His Jupiter should assemble the creatures he had formed, and billet them upon each other, in something like these words; "I have made a multitude of you, more I find than I can well "provide for, but you are welcome to one another, fall to; "and it is much if some of you have not enough, the rest will "be superfluous. Things will find their own level."

(62) But the ambiguity of the terms, "preying upon one another," or rather the fallacy they imply, has been already explained; Nature does not, in point of fact, deliver up her universal offspring to promiscuous slaughter, for the purpose of their sustentation. Such an idea is as incorrect and absurd when generally applied to the animal creation, as it would be if asserted

of the human race. It is as false in philosophy as it is in fact; it is just as though we should say, that because men feed upon geese, geese feed upon men. Invested in all its ambiguity, the expression "that animals feeding upon each other" is consistent with the idea of an excess of numbers, in reference to food, is, as already remarked, absurd; but when we reduce the indefinite allusion to the precise fact, the absurdity is still more palpable, and indeed enlarges into an impossibility. The order of Nature is, that the superior feed on the inferior tribes, from the summit to the footstool of animal creation. If, then, through all the carnivorous tribes, A preys upon B, B upon C, C upon D, and so on from the alpha to the omega of vital nature, what is it that the notion I am opposing holds with respect to every class of them (saving the first, of which more anon), but that they are at one and the same time too numerous and too few?

(63) On the contrary, a very slight consideration of the subject will suffice to convince us that if there be any redundancy, it must be in the means of subsistence, not in the numbers and prolificness of those which require it: otherwise, invested, as the superior orders are, with powers necessary for obtaining their food, consisting as that food does of the inferior ones, those powers would be so sharpened by their unsatisfied and increasing necessities, that the latter would soon be hunted out of existence: and so would it be with all the inferior tribes, till the whole would be extinguished. The very fact of numerous races of animals, whose food is prey, existing in due proportions, or indeed continuing to exist at all, is, when closely considered, proof positive that their prolificness throughout all these tribes is most accurately proportioned; and that it is not in excess in reference to their food. As to the latter supposition; it is at once disposed of by recollecting that if their prolificness were universally diminished down to one-tenth or one-hundredth part of what it is at present, the diminution would equally apply to their food, and consequently their individual shares of it, whatever they may be, would remain precisely the same. The idea that some particular class only of these animals is too fecund, has never yet been broached; it is one which might shock us with its novelty, though it conveys a far lighter charge against Nature

than that the whole are so: but the supposition would be as obviously fallacious. This, in a single instance, would be fatal to other tribes, if not eventually to the whole chain of animated existences, as will be noticed hereafter. The immediate relation, in which many of the carnivorous tribes stand, is threefold; having respect to themselves, to those above, and to those beneath them in the scale of existence, and probably extending throughout the whole of animated nature.

(64) Considering, therefore, the immense numbers thus mutually dependent, the intricacy of the Divine calculation becomes the more apparent, and the hardihood of suspecting its absolute or comparative correctness throughout, the more daring. To supply these through all their orders and degrees, from the greatest and most powerful, down to the most insignificant and minute, with their appointed "food, and in due "season," and consistently with that universal benevolence which is the predominant character of the whole scheme of Nature, is what none but God could perform, and what, if he attempts to do at all, he does perfectly. Here, then, is partly unfolded the reason why, in tracing existence down its lengthening gradations, we find as they become more small and feeble, they are the more prolific and numerous, and multiply in more rapid successions: so rapid, indeed, and in numbers so vast, as to baffle calculation. Still, in no stage of life is there the least evidence that Nature scatters the germs of existence with a more liberal hand than she does the means of their support. The demonstration is one that can alone be obvious to our senses; no geometry can measure, no arithmetic compute these proportions, which must be exact in the minutest calculalation, in order to become balanced in the great and final result. But, if the elements of the calculation were, in the slightest supposable degree, incorrect; possessing as they do such powers, what would be the magnitude of the error in their ultimate effects?—Speedy and universal confusion.

(65) Hitherto, I think, it is sufficiently clear, that the principle of superfecundity in relation to animals, is unphilosophical and untrue; and that there is not this supposed tendency to increase beyond the prepared means of subsistence; which is only repressed within due bounds by their preying upon each other. But a far more striking argument still re-

mains behind, which will not only give a direct negative to the supposition, but further illustrate and prove that Nature visibly regulates with the utmost care all her calculations, so as to preserve a perpetual balance of food and numbers.

(66) I have already spoken of the different tribes of carnivorous animals, as subsisting upon prey themselves, but becoming in their turn the prey of others, and thus keeping up the balance of their food and numbers, through all their various ranks; and that the fecundity of all such is regulated accordingly. But there are certain animated beings which are only subject to half of this otherwise universal law of Nature; they prey upon others beyond all the rest; but, living, they are themselves the prey of none. Placed at the head of existence in their several elements, they inspire that terror which they never feel, excepting, perhaps, when he appears, whose vicegerents they are, and in whose absence they preserve for him his edible domain, and who, armed with all his advantages, still, perhaps, they little dread, when, though but rarely indeed, they come in contact. Such, in the feathered tribes, is the eagle; the lion among the quadrupeds; and, for want perhaps of more perfectly knowing another element, we may fix upon the shark among the fishes. These and their compeers, were there any truth in the position I am opposing, would, at all events, multiply incredibly. The first of them, the eagle, affecting a cold atmosphere, perches on inaccessible heights, or inhabits the vast "Cimmerian deserts of the North;" where his food, principally the fowl, multiplies around him in such incredible numbers, that their flight, when they successively remove, darkens the skies. Scarcely approachable, and rarely molested, what prevents the bird of Jove from multiplying, thus unchecked, without limit? Again; what is the check which prevents the enormous increase of the most powerful and voracious of the finny tribes; or, who rouses "the Numidian lion in his lair," except with a little army collected for that purpose; and which is the beast that devours him? Unchecked, therefore, how fearfully ought he to multiply, according to the modern notion, which invests all things living with this superfecundity! So thought Monsieur Buffon, and therefore talks of whole armies of lions roaming the plains of Africa together. But they exist only in his

interesting pages. Nature determines differently. The lion is a scarce beast, even in his native haunts, as Spaarman has observed; and Pliny, who, perhaps, confounded him with the tiger, tells us, that it was rare in his days; and it continues rare still. What is it, then, that checks and regulates the increase of these? Not their preying upon one another, for that is not the case; as the poet sings,

> Wolves slay not wolves, nor tigers tigers tear;

not the want of food, the dæmon of the modern system; for of that they have a command: but that power whom we have observed regulating all others;—Nature—God! And by the same means, namely, by strictly limiting their fecundity, as he has done that of all other beings, and in each, with an equally exact reference to their station in the scale of existence. In these, therefore, as only subject to half the otherwise universal operation of the law of Nature, as before observed, and being, consequently, not preyed upon themselves, he has diminished the measure of increase, and constituted them the most sterile of beings, save man, whose place they pre-occupy. Aristotle said of such, long ago, τῶν γαμψωνύχων ὀλιγοτοκα πάντα; and a greater than he, Bacon, says of the lioness, that "she ordinarily bringeth forth but one." A late observer, Colonel Keating, perhaps, has corrected this, according to more accurate experience; he says, that a lioness may have three whelps, but that two always die. Respecting the eagle, the first cited author, Aristotle, gives us from Musæus, that she produces three: two live and one is reared. A later authority, and who ought to be a more accurate one, as having far better opportunities of becoming so on this point, Olaus Magnus, says, that "the greatest eagle of all, the gir falcon, very ferocious and strong, never breeds more than one young one." The same observation might be transferred to another element with equal truth, as far as we know of the piscatory tribes. The large fishes of prey, such as whales, sharks, rays, poises, &c., are viviparous, and, compared with the extraordinary fecundity of the lesser fishes, are more strikingly sterile than the animals previously adduced. But, to confine myself to one instance in this element, as in the others. "The "whale," says Busching, "generally brings forth one at a birth;

" and sometimes, though but seldom, two young ones." The cod produces millions. Is there any one so blind as not to see the reason of this? Were this fertility reversed, all animated nature, with which the ocean swarms, must expire, and the polluted waters fill the world with stench and corruption.

(67) I have mentioned, in the foregoing observations, such existences only as seem placed at the head of the several tribes in their respective elements, but, if we trace the subject further, we shall find numbers of an inferior order, who are still of the same character, subsisting by prey themselves, little liable to become the prey of others: but not to particularise these, I may observe, that, without a single instance to the contrary, they all conform to the law of Nature I have alluded to, and are sterile, compared with those on which they feed; were it otherwise, these, too, would spread certain devastation around them. They have, indeed, as will be remarked hereafter, a most important and essential office in the universal scheme of animated Nature, distinct from that of increasing the supply of food: "for such," as Bacon says, "are not ordinarily edible." And their fertility, again, conforms to their nature and position; they are sterile, compared with those which are intended for food, especially that of human beings. Pliny has observed the divine benevolence of this remarkable law. "Benigna circa hoc natura, innocua et esculenta animalia fœcunda generavit." And an older writer than Pliny has remarked the same thing more at length. "Those animals," says Herodotus, "which serve "for the purpose of food, to prevent their total consumption, "are always remarkably prolific, which is not the case with "those which are fierce or venomous. The hare, the prey of "every bird and beast, as well as man, produces young abund-"antly; but the lioness, of all animals the strongest and most "ferocious, produces but one young once in her life." The last instance of the venerable historian is incorrect, but the comparison he institutes is perfectly just, and the cause indisputable.

(68) The fact, then, is incontrovertible, that from the summit to the base of animal creation, and at every step of the descent, we find those beings few and sterile compared with others on which they feed: their appearance in a state of nature is, therefore, comparatively strange, and their devastations

limited. This leaves the vast proportion of animated nature in a state of undisturbed enjoyment, as well as unfailing plenty, and, above all, is the sole cause of the interesting fact remarked by Linnæus, that "no creature can ever totally perish that has been created."

(69) But, granting all this, the question may still be asked: why should those animals of prey, which are placed, as it were, at the head of their respective tribes, and consequently not themselves the prey of others, sterile as they confessedly are, multiply at all, or, in other words, exist? The answer to this important query will unfold a view of nature which, as far as I know, has never yet been presented, and which I shall proceed to give, as having a special relation to the subject under consideration.

(70) It has been an old remark, and one which it is to be hoped will never become obsolete, that the whole of nature, especially of animated nature, seems linked together in a mutual and necessary dependence. I shall refer this idea at present to one only of its elements, the ocean, as it incidentally illustrates a part of my subject already adverted to, namely, the inconceivable numerosity of animal existences; taking the illustration from that intelligent and scientific voyager, Mr. Scoresby. In his remarks on the hydrography of the polar seas, he says, that conceiving the discolouration which is there so remarkably prevalent, to proceed from animal matter, he substantiated the fact by submitting the water to a powerful microscopic examination, and detected medusæ and animalcules in numbers, which, as applied to the extent of the waters so impregnated, we may talk about, but which we can comprehend as little as we can infinity. To complete the enumeration of one of the larger of these genera, existing in a couple of square miles, according to a calculation he made, would have required the labour of 80,000 persons from the creation to the present hour. As to the smaller, he says, that on computation there must have been in a single drop, and that by no means the most deeply tinged, 26,450. "These animals," he observes, "are "not without their evident economy; on their existence pos-"sibly depend the being and preservation of the whole race "of mysticete, and some other species of cetaceous animals. "For the minuter medusæ apparently afford nourishment to

" the sæpiæ, actiniæ, cancri, helices, and other genera of mol-
" lusca and aptera, so abundant in the Greenland sea; while
" these latter constitute the food of several of the whale tribe
" inhabiting the same region: thus producing a dependent
" chain of animal life—one particular link being destroyed, the
" whole must necessarily perish." By other observations it appears that some of these, too, are migratory, supplying their almost total want of locomotion by sinking into those sub-currents, or rising into the superior ones, which have the effect of blending the waters of the equator and the pole, so as to produce a more equable temperature than could otherwise exist in either, and in these changes, no doubt, still performing their office of victualling the recesses of the watery world. These, still more than the insects of the Scandinavian regions, are therefore innumerable, and supply thosevast and incessant shoals which Nature perpetually pours upon all our shores, not one in one million of which is taken; as do those clouds of wild fowl that, when mature, are dispersed throughout the earth: both, therefore, constituting the inaccessible north, if I may so express myself—the victualling-office of the world, in which Nature does not permit herself to be interrupted in her beneficent operations.

(71) Not to affect any scientific arrangement which might not be sufficiently familiar to answer the purpose of illustration, let us suppose, that among these inconceivably numerous animalcules of different orders, the inferior and most minute support the superior, which still enlarge in size, till they become the food of the sprat, the sprat of the herring, the herring of the cod, and the cod of the shark; and take the shark as a fish of prey, on which no other feeds, as I previously did the eagle and the lion from the other elements. I do not, I repeat, represent such to be the food of these different species respectively; but I do say, that if we could trace the economy of piscatory sustentation more exactly, the minute facts which it would exhibit, would fully confirm the truth which the idea, as I am now presenting it, imperfectly illustrates. Now it is abundantly evident, that, in such an arrangement, the shark could not continue to exist without the sprat, (to descend at present no lower in the chain of existence,) but it is equally true, though perhaps not at first sight quite so plain, that the

sprat could not exist without the shark. And this is the fact which, as I conceive, has not hitherto been noticed.

(72) Let us pursue, then, this most important consideration: one which, in attempting to comprehend the balance of the numbers and food of living beings ought never to be out of recollection; but which seems hardly ever to have been in it, as it regards those who pronounce so confidently on the superfecundity of animal creation. Alluding to an undisturbed state of nature, to which I refer the argument in the first instance; the least alteration in the measure of that fecundity which varies so greatly in different species, and which some conceive to be at best a blind and erring calculation throughout,—I say the least alteration, whether of diminution or increase, would have been equally fatal to all connected and dependent existences. In contemplating reproduction in single instances, we may perhaps imagine that these variations are trivial in their effects; but the arithmetician will soon recall us, from such ideas, to our senses, and shew us what would be the inevitable consequences of altering the generative power in the roll of ages, or often indeed in a single generation. Imagine, then, a miscalculation respecting the fecundity of the shark, and that it should be in excess: those acquainted with the powers of progressive numbers need not be told how speedily this excess would accumulate into unsustainable shoals, and that this ferocious fish would first sweep the ocean of its food, and then expire itself. Supposing still, for illustration, that food to be the cod; then the disappearance of the cod, no longer preying on the herring, the herring, in vastly increased numbers, multiplying as before, would, in its turn, destroy the sprat, and itself consequently disappear for want of further sustentation. All this is sufficiently plain; and what at first sight appears to be otherwise, begins to be equally so; namely, that, secondly, an error of deficiency in any of the animals of prey would be equally fatal with one of excess. Thus, if the shark should, on the contrary, multiply in too slow a ratio in reference to the increase of the cod, the undue accumulation of the latter would press upon their food, which we represent as the herring; these would be destroyed, and then the sprat, left to multiply from such increased numbers, would exhaust the food destined

for its support, and expire after it had thus transmitted devastation through every lessening link of marine existence.

(73) In again observing that this illustration does not express the precise economy of the piscatory tribes, which is certainly far more complex (involving, in all probability, almost an infinity of interchanging modes of existence), I must intimate to those who are prone to disregard, if not deny, what they cannot fully trace and understand, that this complexity forms an essential feature of my entire argument. To perform one grand uniform result by a variety of means almost infinite, surely indicates more of intention and wisdom, and is less liable to the charge of accident and mistake, than if it seemed to be produced by one simple, independent cause. If, then, this chain of connected being is multiplied into ten thousand catenations, and so connected in its involutions as to inclose the whole of animated life, it cannot surely evince less calculation and skill in the artificer than if it consisted of a few links. The more numerous, therefore, the means by which the universal scheme of Nature is upheld, the more exquisitely exact, instead of careless, must evidently be the calculations respecting each. If, then, the five gradations into which I have divided my exemplification, were multiplied into five thousand, as probably they ought to be, it follows that it is as many times more necessary that the calculations respecting each should be minutely correct.

(74) In saying, therefore, that the measure of fecundity, in the several orders of animals dependent on each other, is neither erroneous in deficiency nor excess, but precisely accurate, I deliver the argument into the grasp of the computist, to use Dr. Johnson's expression, from which I feel certain no human sophistry can rescue it. The first principles of arithmetic, as well as the evidence of our senses, equally prove that numbers and food are balanced.

(75) It may, however, be objected to the argument which proves the necessity and certainty of these minute calculations regarding the natural prolificness of animals; that it equally assumes that those occasional accidents or interruptions, to which all their tribes are subject, would be, at length, fatal in their result, to the whole scheme of Nature. That this would be the case, appears to me to be equally clear, were there not

a countervailing law of nature, one which, it will be fully shewn elsewhere, regulates human prolificness, and which, we may conclude, is in constant operation among animals in their natural state; though perhaps little observable when their numbers are regulated by mankind;—a law which varying their fruitfulness according to the different circumstances in which they are placed, has the effect of maintaining that equilibrium which was primarily established, and which this, as well as every other principle in creation, has a manifest tendency to preserve and perpetuate. Of this fact, some very striking and conclusive proofs might be given, but it would involve a series of arguments and calculations hardly suited to the opportunity. I shall merely observe, that in the general scheme of creation, there seems no events anticipated, no order of beings in jeopardy. Hence, in the eye of true Philosophy, "not a sparrow," for instance, "falleth," the existence of which has not been provided for, the death of which is not compensated; or, in other words, without the notice of Him in whose sight what man calls chance and accident have no place.

(76) But to return. I have now stated some of the reasons why animals of prey, eminently sterile through all their tribes, exist at all; and I think they suffice. And it is wonderful to observe how true Nature keeps to her rule, in this respect, through every part of her wide domain; the exceptions to which are such as abundantly confirm its general necessity. In the newly discovered islands of the Pacific, there are no large edible quadrupeds; hence there are no animals of prey to regulate their numbers. But to appeal to the vast and fertile continent of America: till Columbus, not three centuries ago, landed his small number of horned cattle, and his eight sows, there were none of those animals, nor even sheep on that extensive continent; the number of quadrupeds was few, and those principally of the minor tribes; and hence the beasts of prey seemed to conform exactly to that state of things, there being only one or two of any note, the jaguar and cougar, which are far less formidable than the ferocious animals of the old world. But the fishes in the rivers and coasts of that continent are numerous; hence the seal and the cayman abounded. In like manner, the feathered tribes were in astonishing multitudes: so, therefore, were the serpents.

Thus is it that the circle of Nature, however enlarged or contracted, must be perfect and complete in itself to be perpetuated: a circle which, to use the illustration of our great poet, has been circumscribed by the golden compasses of the Eternal, and which he has filled with his wonders, and satiated with his mercies.

(77) Perhaps, however, it may be said that this chain of existence, so visibly perfect, and complete, where Nature is undisturbed in her operations, is as evidently broken, wherever she is greatly interrupted; and that, when those animals of prey, to which our attention has been directed as the preservers of the balance of numbers and food, are driven away thence, or destroyed, still the rest of creation continues to exist. My answer to this final objection brings me to the last and far most important reason of their creation, and continued existence upon our earth; and this has an essential relation to that state of things which the Deity doubtless contemplated when he created our world, and especially to that being whom he condescended to place at the head of it: without whom the universe would have been incomplete, and, with all its infinite myriads of inhabitants, still destitute of a single creature who could recognize the universal Parent,—the temple of Nature void of a single worshipper of its indwelling and presiding Deity,—and that everlasting anthem of praise, with which it resounds, hushed in eternal silence!—that mysterious being, whom the Eternal has placed, as it were, midway between immensity and nothing; who, though a creature to God, is a god to his creatures, and whom the King of the Universe has crowned with glory, and arrayed with his own vesture of immortality! And to whom, in the language of an ancient poet, he "has given dominion over the works of his hands, and "put all things in subjection under his feet:" or, to express myself in the words of a later writer, and one, perhaps, less objectionable to modern philosophy, "Principio ipse mundus "Deorum hominumque causâ factus est: quæque in eo sunt "omnia ea parata ad fructum hominum et inventa sunt." Thus is it that all creation, with its unnumbered forms and exquisite adaptations, has a prime and final reference to man.

(78) And yet, astonishing as the assertion seems, and almost exceeding belief, if we were not perpetually hearing it

it repeated; touching this one creature, at once the sole genus and species of his kind, whose increase is the most strictly guarded of all others, and who is indeed the most sterile being in existence,—to sustain whom, not only the vegetable kingdom offers its inexhaustible resources, but to whom the whole animal creation, in every element, is surrendered for that special purpose,—it is pronounced that even his food and his numbers are not duly balanced; but on the contrary, in such grievous disproportions has Nature established the principles of their increase, that, without unnatural or cruel expedients to rectify her errors, present misery must ensue, and in "a thousand years" (which, with his Creator, is but as one day) the discrepancy would involve him in universal distress and threaten his final annihilation.

(79) But, on the contrary, I shall now proceed to the proof that numbers and food are balanced, as it respects this last and most perfect work of the Creator,—man. In doing this, I shall not take up the question in the form in which I have elsewhere considered it; proving my assertion from a series of arithmetical calculations, involving all the registers of human existence to which the public has access, in every country where the necessary documents have been made matter of record; nor shall I treat it as an argument *de futuro;* but I shall continue to discuss it on those more obvious and popular grounds which, however the argument is constructed, must ever form one of its most important branches.

(80) That the numbers and food of human beings have a strict relation to each other, and are, as far as the wisdom and benignity of Nature are concerned, balanced, I prove, then, by the same train of reasoning which I have already advanced, in considering the same balance in reference to the rest of the animal creation. All the operations of Nature we cannot but remark are constantly conducing to this very end. We can open our eyes, or direct our minds, to no part of creation which does not evidence this. All those numerous causes which contribute to the sustentation of the animal tribes are again put in requisition in behalf of man; and as it respects him, those causes are multiplied beyond calculation, while each is rendered vastly, I had almost said infinitely, more efficient. So intent does Nature seem to be on her great work of sustaining man.

(81) Here, however, is the place to observe, that the ample provision Nature has made for all creatures, is bestowed upon one indispensable condition; but it is one that contributes to their pleasure, as well as promotes and secures their health: it is exertion. To this catholic law of Nature man is submitted, and in a severer degree, as we may think when superficially viewing the subject, than all the other tribes of life. But to the stricter operation of this law, he owes the exercise of those powers, mental as well as bodily, by which he rises so greatly superior to them all. It is this which is the means of elevating him through the wide gradations of his own existence, from barbarism to the highest state of civilization. Moreover, the peculiar nature of that exertion which is required of him, in order to his sustentation, is the cause of that appropriation of the bounties of Nature which is peculiar to his race, and which necessarily lays the foundation of those social and civil institutions which conduce so much to his prosperity. This appropriation, however, which was evidently, in the contemplation of the Creator, as necessary to his existence, involves those striking inequalities in the distribution of the bounties of Nature, which have ever existed in human society, especially in its more civilized stages; and these, again, the Creator has anticipated, implanting deep in the human breast those sacred impulses which prompt the fortunate to distribute of their superfluity to the destitute; thereby awaking mutual feelings which heighten into pleasures, and more than compensate for the distresses in which they originate. It is thus that, watered by mingling tears of sympathy and sorrow, the heavenly plant of Divine charity is seen rising in all its fragrance and beauty, and bearing its perennial fruits, which are for the healing of the nations. But this feeling is peculiar to man, and is evidently given him to remedy the tendencies of that appropriation to which animal creation is a stranger. Political economists, however, contemplate a system, which shall, in great measure, dispense with this distinguishing virtue of human nature, and which, if realized, would therefore rob humanity of its noblest attribute,—that in which it most resembles the Creator, and leave it only the selfish instincts of the brutes that perish.

(82) Thus much I thought it needful to premise, in answer to any objections which might be, and often are, taken

against the sufficiency of the provision of Nature for all mankind. I proceed, therefore, to shew, that when a necessary part of the universal supply is thus distributed through the channels of kindness and mercy, there is still "enough and to spare;" at least, that numbers do not, any more in the human species than amongst animal nature, overbalance food.

(83) To proceed, then, after this necessary digression, with the general argument; it remains to be further considered why, in reference to the human race, mere animals of prey exist at all in a state of nature. They exist, *lastly*, as the regulators of the numbers, and consequently as the preservers of animal creation, till man himself appears; in other words, just as long as their office is necessary to him, and no longer; till, as the master animal of prey, he assumes the dominion which such were appointed to preserve for him.

(84) The history of man presents him to us, in the first stages of society in every country of the world, as comparatively few; and as dispersed over vast tracts, solitary: his numbers progressively increase, till at length we find him multiplied into mighty nations. At first he reclaims, from the dominion of the wild beasts, but a small part only of the earth, which he gradually extends as his necessities require; making war upon them as he advances, either dispossessing or destroying them, till, at length, they utterly perish from the country which he fully occupies. Now, if these were necessary in a state of nature to preserve the whole of animal life, by balancing its numbers and proportions, (which I trust has been fully shewn,) then is the utility of these objects of dislike and dread manifest, especially to man: they have actually preserved for him that profuse provision which Nature ordained for his use, till he appears and enjoys it. This, I think, is a true, and by no means a new view of this important branch of the subject.

(85) Any material destruction of these ferocious animals, in anticipation, and before mankind were sufficient in numbers to take their place, were it very practicable, we may conclude (if the foregoing reasonings are just) would be injurious; and would be fruitful of calamity rather than of benefit to the remaining tribes of animal life, unless Nature, ever fruitful in resources, should restore the balance in some other way, not very comprehensible to us at present. Practical exem-

plifications of this fact, it is obviously almost impossible to give: one very interesting instance, however, just rises to my recollection. In the Carolinas, very slenderly peopled even at present, and where the necessities of the inhabitants have not compelled them to have recourse to the supplies which the waters afford, which, though so nutritious and healthful a food, is nevertheless always among the last to which mankind, in general, willingly resort; the cayman, (the American crocodile,) once numerous, has been almost entirely destroyed: hence, says Chateaubriand, the rivers are often infected with the multitudes of fishes which ascend from the ocean, and perish. Here the removal of the check without its substitution, (evidently a breach of the economy of Nature,) is productive of multiplied misery.

(86) But the steps of the Divine economy, in reference to the larger animals of prey, are, indeed, peculiarly manifest. Their destruction almost always bears a due proportion to the multiplication of mankind: hence the most formidable of them have long since ceased to exist in Europe; and the wolf, which still continues to infest some of its more solitary tracts, will disappear as man advances, as it did long ago from this well-peopled island. Lions thus are no longer found in many parts of the world—in Greece, for instance; and should population press onward in the eastern and southern quarters of our globe, and spread those useful agricultural pursuits with which it is inseparably connected, the lion will no longer exist, and will be remembered only in tradition, or known to us, as the mammoth, by some unperished remains of his majestic form.

(87) The animals of prey, therefore, exist only as preservers of animated creation, for the use of man, and disappear when himself approaches. They are, without a figure of speech, the *locum tenentes* of him who is the master animal of prey throughout the world. The co-existence, then, of these and man, would be incompatible with the scheme of Nature, and would, indeed, destroy, instead of preserving, the balance of food and numbers throughout the edible creation. Mark, therefore, how Nature has interposed insuperable obstacles and barriers against their co-existence, which she knows would be mutually destructive. She has kindled, between these and mankind, the fiercest animosity: other animals may fear man; these join

hatred and defiance to fear; they are to each other irreconcileable rivals; when they meet, they either fly or contend to the very death; and no compromise has existed, or ever will exist, by which they shall conjointly prey upon creation. Nor is she satisfied even with this precaution; she has removed all possible temptation from human beings to evade or reverse this important law. The flesh of these animals, as Lord Bacon has observed, whether of beasts or birds, is not edible to man; it is, to use an emphatical word, carrion; man, therefore, has no inducement to favour their increase as forming part of his food; while, on the other hand, all his ingenuity and all his patience cannot tame such to his purposes in other respects; they are, consequently, not only highly dangerous, but utterly worthless to him. Look at the difference made for this special purpose betwixt an animal of prey and an herbivorous one; compare the elephant and the ox, for instance, with the lion and the tiger;—the first amongst the mightiest masses of vital power in the creation, are readily reduced to the docility of a child, and the patience of a slave, in the service of man: but where is the second Bacchus, that shall attempt to couple the latter, and yoke them to his car? Buffon, if I rightly recollect, has a fine passage on the docility of the useful animals, compared with the voracious ones:—a sentiment happily fully as familiar to the mind of the peasant, as it is to that of the philosopher.

(88) I cannot refrain here from enlarging so as to draw another most important and interesting inference, from the comparison between the carnivorous and herbivorous animals. Supposing that the appetite implanted in man had been reversed,—that the ravenous animals had constituted his most acceptable food, and that, consequently, their breed were encouraged: when we reflect, on the one hand, on their sterility, and, on the other, on the nature of their food, as well as their voraciousness, it must be obvious that such a regulation would have at once greatly diminished human subsistence, and, therefore, reduced mankind to a very inconsiderable number. Whereas those animals on which he principally subsists, are not only, as has been just observed, incomparably the most prolific; but, by abstaining from flesh themselves, they offer their utmost supply wholly untouched,—thus becoming the means by which that part of the vegetable kingdom which he cannot

receive as food is converted into it, making an addition to his sustentation, not only immense in its amount, but apparently necessary to his health, as well as enjoyment.

(89) It has been already observed, that these animals of prey, instead of exhibiting the supposed tendency to undue increase, on the contrary do not multiply beyond the number essentially necessary to fulfil the purposes of their Creator with reference to the rest; and that the principle of that multiplication is most strictly guarded and regulated, as it has not to be rectified hereafter, by such becoming the food of each other, or of any of the inferior orders, as is erroneously supposed: so, if the preceding views are correct, the analogy of Nature will require that that being who has to supersede them, should be conformable to like laws; and such is the case as it respects man. His species do not prey upon each other, not being, naturally, cannibals; nor is he the destined prey of other animals; this his immense superiority over the whole of creation prevents: his increase ought, therefore, to be specially guarded and circumscribed; and such is the fact: he is, even in comparison with those animals of prey whom he dispossesses, universally sterile. But as it regards him, as a want of food would be the most severe and sensible of evils, so Nature has provided against this by a physical law which I have detected as regulating his increase, and which I believe to extend to the rest of living beings. Without alluding to this law at present, if it be clearly shewn that Nature is more active and anxious to supply this one genus, comprising, comparatively speaking, a few beings, than she is to support all the rest of her numerous offspring, which we nevertheless see enjoying a profusion of the means of subsistence, little more, I think, need be advanced in proof that the numbers and the food of human beings are balanced.

(90) But how stands the proof that Nature is more liberal of her means of support;—more careful to accomplish her purpose in behalf of this one species, than of all the rest of creation? It stands thus: If, respecting other orders of animated beings, severally considered, one only of the kingdoms of Nature, either the vegetable or the animal, and that only in strictly limited parts, is generally afforded to their sustentation; respecting man, each is offered, and offered almost without

limitation, for the same purpose. If particular tribes are confined to their own elements in their supply of food, each of these elements yields him its tribute of support, and some of them in unlimited quantities. If different climates and seasons are required to produce the means of subsistence to separate divisions of the family of Nature, all the climates and every season furnish his board with their various and successive stores. If astonishing instincts are impressed upon various animals, in order to obtain or continue their necessary supplies, touching man, the godlike attribute of reason, as far surpassing instinct as mental perception does bodily sensation, instructs him to bend all Nature to his purposes, and to provide, under all emergencies, for his present and continued sustentation.

(91) Nor need we confine our observations to the bare means of subsistence. Respecting this being, his Creator has not merely adequately provided for his preservation, in common with the rest of animated beings, but has condescended to gratify the wants necessary to his existence, with a variety that solicits as well as satiates his appetites. These different supplies, therefore, to which I have alluded, do not come to him in the form of unsavoury doles,—or, to use an old English phrase, the make-shifts of Nature; they constitute the endless and gratifying varieties which furnish the repasts of human beings.

(92) But not only has man the command of edible nature thus surrendered to him, but with it the wonderful faculty of increasing the productiveness of any part thereof which may be most suitable or agreeable to him; another advantage of which the animals are likewise totally devoid. The useful plants and fruits which he selects from the wilderness; and cultivates with care, become, under his hand, productive to a degree almost inconceivable, if contrasted with their wild state. Take a single example, and let that be the most important one;—wheat. Diodorus Siculus informs us, this is indigenous in Sicily, his native country. There is still said to be in that island a species of wild wheat, but which is, perhaps, compared with the cultivated, what wild oats (with which most of us are familiar) are, compared with our present samples of that grain—barren and unproductive; but let this wheat be duly cultivated in a soil prepared by human industry, and we are informed by Pliny it has been known to yield from 300 to 400

grains for 1; and Herodotus assures us, on his own authority as an eye-witness, that from 200 to 300 was the regular return in Babylonia. Perhaps these ancients may be doubted; not, however, by those who are acquainted with the creative powers of human industry. Du Hamel informs us that he has seen barley produce 4800 fold: and, to return to the former plant, wheat, a scientific countryman of our own, Miller,—a name well known in the annals of culture—performed an experiment in the botanical garden of Cambridge, of which he was curator, by which a single grain of red wheat returned 22,109 ears, and 566,800 grains. Had he carried his division of the root one step further, which, he says, other experiments convinced him was fully practicable, he should have obtained ten times the quantity from the same single grain; namely, between five and six million-fold increase. This is recorded in the Transactions of the Royal Society for 1768, and verified by Dr. Watson.

(93) The same interesting fact holds good, though not to the same extent, as it respects the animals which become part of the subsistence of mankind: hence Lord Bacon says, "Creatures which, being wild, generate but seldom—being tame, "generate often:" a circumstance which had not escaped the attention of the ancient philosophers.

(94) We have already observed that man, beyond all other animated beings with which we are acquainted, has the faculty of sustaining life, with the least inconvenience, in the widest range of climate. This faculty, however, would be of no avail, unless seconded by another provision of Nature, namely, that those productions, whether vegetable or animal, on which he chiefly depends for subsistence, were endued with a capability of enduring a similar change; and this is remarkably the case. I need not allude to the torrid zone, where Nature is so profuse of her bounties; but I will give a single instance from the frigid one. Von Buch found the business of pasturage advantageously pursued, and even grain, healthy and prolific, and succeeding admirably, some degrees within the arctic circle; namely, on the verge of the 70th degree of northern latitude.

(95) But here allow me so far to digress, as to observe that man is again different from all other animals; in that food does not constitute the sole necessary of his existence. It seems hard upon him, on a superficial view of the question,

that, while all other animals are presented by Nature with a covering suitable to them, and to the situation in which they are placed, he alone, to whom, in the wide range of climate he occupies, it appears the most requisite, should remain naturally destitute of any; but this circumstance also, when properly considered, is essential to the well being of the species, especially in a state of civilization. That men are born naked, as a benevolent writer has observed, constitutes one of their advantages: it gives them employment, and makes that employment indispensable. It unites, therefore, in the bonds of necessity, the whole human family; and breaks into fragments that monopoly of property, and consequently of provision, which obtains wherever civilization spreads. Without dwelling upon this point, I will just observe that, after having created this essential want, the way in which Nature supplies it is most remarkable, shewing those minute adaptations, which leave little room to doubt but that every thing connected with the comfort of man, and consequently, above all things, his adequate sustentation, has been amply provided for. As the climates vary the necessity under consideration, the supply which Nature furnishes, is always in strict reference to that variation. As to his clothing, therefore, Nature still wears his livery wherever he moves. In the hot climates, silk and cotton are presented to him; in the temperate ones, these yield to the finer wools; which, as the latitude northerns, become thicker and more plentiful, till, in the frozen regions, fur, much the warmest of all coverings, is produced in abundance. Not a few of the other animal, as well as vegetable productions, which cannot sustain the change of climate in an uniform state, vary their condition in reference to it, as, for example, that most useful of all the quadrupeds, the sheep.

(96) Should it be attempted to evade the force of this argument, by attributing all these changes to the operation of physical causes, what shall be said of a more irresistible proof of the same cheering truth—the plain intention of Nature, to support in comfort human beings in every climate, namely, that when she can vary the different tribes of creation no further, without destroying their character, then, for his sake, she creates new ones, so obviously adapted to his local

necessities, that he could not continue to exist without them? Take two examples, and two only; one from each of those parts of the globe which are justly conceived to be the least friendly to human life, and consequently the most needing such extraordinary aids: the first, from the torrid zone; and let the camel be the instance. This singular animal, in the first place, has, of course, to be adapted to the peculiarities of the climate, in order to its own existence; and this is strikingly the case. In a region where there is little vegetation, and less moisture, Nature has constructed its muscular frame on the most spare and economical principles; on such, therefore, as demand the smallest supplies: hence, it requires little food, which, to make the most of, it ruminates; it must consume that food hard and dry: it has, consequently, great muscular force in the jaw. Above all, it is probably beyond any other quadruped in creation patient of continued thirst; a quality which, in such a region, seems to reverse the very nature of things; and yet, without this one singular provision, all the rest would have been of no avail, in so parched and weary a land as it has to inhabit. Other anatomical adaptations might be pointed out, but I shall merely mention its hoof: this is lined with a lump of flesh, which would, in great measure, prevent its utility in the hard and mountainous districts of Europe; but which is plainly adapted to the dry, sandy, and level soil it has to traverse. But all these peculiarities, so necessary to its own being, subserve that of man. The flesh is acceptable; the milk nutritious; while the patience and gentleness with which Nature has endued it, have rendered it the obedient slave of the human species. In short, to use the words of an author not generally accused of enthusiasm, Volney: "So "great is the importance of the camel to the desert, that were "it deprived of that useful animal, it must infallibly lose every "inhabitant."

(97) Look next at the frigid zone. In its more remote recesses, where Nature seems to be so sparing in all that is necessary to life, and so profuse in what is deemed hostile to it; where the cattle, accounted essential to our comfort, if not to our existence, could not, generally speaking, either live or be fed through the long and rigorous winter which is there experienced, and which, if they could be preserved during that

period, would not answer the necessary purposes to which we apply them? Is, then, the Laplander deserted by Providence? On the contrary, it has presented, exclusively, to him one of the noblest animals in existence; and, in its formation, has so economised the scanty means of nature, as to unite at once the valuable properties of almost every other—and all adapted, specially, to the peculiar station it has to occupy. I need not say I allude to the rein-deer, a quadruped which comprises every thing he wants, either for life, convenience, or luxury. Its milk rivals that of the cow; its flesh that of our deer; its fleetness and docility those of the horse; and He that placed him there, so contrived that part of the frame which I have alluded to in the other instance, that the hoof of this wonderful and interesting animal should, contrary to its own genus elsewhere, spread out, and become, literally speaking, a snow-shoe; so that it can convey its owner over that mantle of snow which covers, for so long a portion of the year, rocks and vallies, woods and plains, lakes and streams,—with an incredible swiftness, where no horse could travel at all, if he could even live. Without sustenance, the gift, however, would be of no avail: this is anticipated and supplied. In that rigorous climate, so adverse to vegetation through the greatest part of the year, a moss is, nevertheless, produced in profusion, hardly found in other climates, where it would be of little use; this the animal finds beneath the snow by a peculiar instinct, and by this it is amply sustained. This is a single evidence that the Supreme cares even for the humblest of human beings, the Laplander; and I could no more bring myself to believe that it is not to His plain intention that he is indebted for his sustenance, or that such sustenance was insufficient, than I could, that the noble animal on which his existence depends, is the product of an animated film fed upon moss, which never rested in its improving efforts, till it supplied itself with snow shoes.

(98) In a word, all the laws of the vegetable, as well as the nature of animal, existence, are plainly subservient to the solace and sustentation of human beings; and, in pursuing the proof of this to whatever limits, we should not be in the predicament of some who think that miracles end where knowledge begins; but, on the contrary, we should find that, as our knowledge increased, the miracle of the Divine wisdom and

benevolence would enlarge, till the feeding of an ancient Seer in the wilderness of Carmel by ravens, would seem to make a far less demand upon the prescience and the power of the Deity, than the constant and mysterious operation of that endless chain of causes and effects, receiving its primary impulse from the same power, by which every single being, rational or irrational, is sustained and fed. We have, indeed, obscured our intellects, and benumbed our feelings, by making use of words that, strictly speaking, as we too frequently employ them, have no meaning. We talk of causes and effects, as words of course, quite plain in their signification to the slenderest capacity. As expressing facts deduced from our observation of the laws of Nature, this phraseology may be allowable; but when we have observed two or more facts in a certain, constant connexion with each other, and have remarked the order of their priority, we are as far as ever from furnishing either to the judgment, or the imagination, any light as to the reason of such connexion. The motions of a grain of sand conform to certain laws which we have observed upon, and to this conformity we give a name,—attraction; but we know as little about the nature of this attraction as the unprotected child hurt by the fall it has occasioned. What are, therefore, denominated causes, are nothing more than determinations of the Deity; which, as founded in infinite wisdom, may be uniform and unchangeable in their nature. If, therefore, I put into the earth a seed, " it may chance be of wheat or some other grain," and trace the miracle of vegetation from its commencement to its completion, when I observe it has extracted from the earth matter hundreds of times its own weight, and of a nature totally dissimilar to the elements from whence it springs, and for purposes essentially different, I may notice, throughout, a number of connected effects, but I discern no cause beyond the will of the Deity. In like manner, if I regard the purposes for which this crop of grain is evidently designed, namely, for food, and when becoming such, it is, by quite as inexplicable a process, partly converted into an animal substance, and becomes a portion of myself, I again discern effects, but no causes, beyond the will of the Deity. It is thus, therefore, that I have treated the subject under consideration throughout.

In establishing the balance between life and its sustentation. I have pointed at the plain indications of the Supreme will that will, once ascertained, it is as plain as the indissoluble connexion between what are called causes and effects, that the balance of food and numbers is eternally established.

(99) Rousseau has well observed, that the marvellous has a strong hold upon the opinions, as well as the feelings, of mankind; and the argument I am now pursuing has this support,—it has more—for when truth is added to the marvellous, the effect upon the human mind is irresistible. I shall, therefore, lastly, shew that it is plainly the intention of Nature to sustain man, from the way in which one of the most inexplicable of the animal propensities, previously alluded to, is ultimately made to subserve his necessities: I mean, migration. The circumstances connected with this incomprehensible deviation from her general laws, have, in the first instance, doubtless, a special relation to those which are submitted to its operations, but as plainly, and indeed more clearly, administer to human beings; and are sufficient to convince any one whom nothing but the most miraculous interpositions can assure of the fact, that Nature means to sustain man.

(100) But not again to advert to those facts regarding migratory animals, which have reference to themselves, I shall now refer to such only as are plainly conducive to the welfare of our species. The object of Nature in this respect appears to be twofold: First, to afford a timely supply of sustentation to human beings, especially in the first stages of society, when their numbers are few, and the earth consequently but very partially cultivated. The quadrupeds which, in such a state, administer to his means of subsistence, are far more numerous and important than we at present have, perhaps, a conception of. Some species of the Bos, a genus by far more valuable than all others to human beings, are, in a state of nature, evidently migratory: the Bos bubulus, for instance, as our northern hunters, as well as intrepid voyagers, well know. Such, too, is the Bos bonassus. So also are various species of the Cervus, both in Europe and America. To these I feel little doubt but that another of our most important animals might, when in a state of nature, be added. These, as Chateaubriand

asserts, have the periods of their migration as exactly calculated as that of birds, and, like them, evidently accommodated to the utility and necessities of man.

(101) But to advert to the more unrestrained migratory tribes of the air and ocean. Respecting "the great and wide sea," we see this principle wonderfully exemplified. From the prolific North those innumerable shoals are sent forth and directed by some mysterious impulse, the import of which is, however, sacredly plain. Poured upon the shores, rather than distributed in the unfathomable depths of the ocean, and in a constant succession of kinds throughout the whole year, they become perpetually available to the necessities of man; to those of his race, especially, who may be confined to the limits of an island, which, as the author I have in my eye conceives to be so appropriate an arena wherein to exhibit the triumph of his system, supposing then that man "unchecked" would be there in a state of siege, without adequate provision and devoid of means of escape. Into such a garrison, however, Nature thus throws perpetual supplies both from the ocean and the air. Nor is it on the shores alone that this element pours its ample donatives, those numerous tribes which perpetually replenish the storehouse of mankind. Some of these, the salmon, for instance, urged by a still more powerful impulse, and endued with a surprising faculty of sustaining an essential change in the nature of the element they inhabit, in order that they may obey that impulse, leave the salt waters of the sea, entering all the rivers, tracing them up all their accessible ramifications, ascending almost to their very sources, and thus yield, in wonderful abundance, even to the mountain shepherd, one of the most nourishing and luxurious repasts the distant ocean affords.

(102) As it respects the birds, the supply these yield to mankind, especially in the least fruitful seasons of the year, is remarkable: a supply at all times most acceptable; but before population has multiplied sufficiently to secure plenty from the permanent resources of agriculture, of essential necessity to his support. This, the early settlers in North America found, in regard of the pigeon species, of which, in that open and extensive region, are migratory; as well as many quadrupeds also, which are here commonly deemed stationary. These, therefore, had an emphatic denomination amongst the

inhabitants of the early plantations: they were called "the victuallers." Douglass, Williams, and others, have presented us with accounts of the extraordinary numbers in which these appeared before the country was cleared; and, since then, the celebrated ornithologist of America, Wilson, has given us some idea of the multitudes still existing in the remoter parts of the country, which fully justifies the assertion of Kalm, that their numbers are beyond conception. He says that on calculating, in a manner which he explains, the amount of a single flight of these, steering towards the north, in order to supply that less fruitful region with abundance, he judged them to amount to 2,230,272,000, or at least a brace of pigeons each to every man, woman, and child in the universe. But how many are the different tribes of fowl that obey this law, and plainly in reference to the subsistence of man; and some of them, for reasons to be advanced, of still more importance to him, such as the goose, the teal, the duck, the woodcock, the plover, the lapwing, and others; all of which visit us when the earth is bare, and, consequently, to replenish our lessening stores of food by a timely recruit of the bounties of Nature!

(103) Addressing myself to Englishmen, even to a scientific assembly of them, still I may be allowed to observe, that this amazing proof of the Divine intention to sustain mankind is liable to be overlooked, or, at least, to be insufficiently estimated. Our insular position prevents us from witnessing the migration of the quadrupeds alluded to; and as to the fishes and the fowls, which obey the same benevolent law, the unexampled richness of our internal resources enables us to overlook the addition to our food which the air and the ocean thus offer to our acceptance, unless with a view to vary our luxuriant repasts. But place us in the inhospitable regions where man is more dependent upon the immediate bounties of Nature, and how should we then regard the subject? This amazing provision would appear as a perpetual repetition of the ancient miracle of the wilderness; and none who were not divested of reason, as well as feeling, could fail to recognize in the timely supply, that hand, so visibly stretched forth in behalf of his offspring. To avail myself of the language of one of the most interesting travellers who ever wrote, when regard-

ing one only of the tribes which obeys this constant impulse, in the very regions supplied by it, Dr. Clarke says; "A more "stupendous gift of Providence to supply the wants of its "creatures, is hardly offered to our consideration in the "history of mankind. Their coming may be almost compared "to that of the fowls of heaven which fed 600,000 Israelites, "when there went forth a wind from the Lord, and brought "quails from the sea, and let them fall two cubits high upon "the face of the earth."

(104) Seeing, therefore, the plain intention of Nature in these astonishing deviations from her general laws, and not doubting, as Chateaubriand expresses himself, that if these migratory tribes were abandoned for a single moment by Him who directs them, they would all perish; and observing, as the same author remarks, that the reasons of all their movements have, in every instance, a special relation to man: who can doubt, for a moment, that we view, in migration, one of the many means, and of a most unequivocal nature, by which the Conservator of the world is intending to sustain, and is in the very act of sustaining, his creature, man? His intention manifest,—who shall say that it is frustrated, and that man is not sustained? That the numbers and food of human beings are not balanced by the hand that created both?

(105) But another, and a still more important purpose than that of affording these stated supplies to certain parts of the earth, was, as it appears to me, to be answered by the migratory principle: one that should continue the cause of still greater benefits to human beings, when they should have so appropriated the earth as to interrupt these migrations, at least as it respects one of the orders of creation, and that the most essential to them, namely, the quadrupeds. Every thing instructs us to believe that human beings spring from one source, and diverged as from one centre, till they overspread the earth. Nor does it appear very unlikely but that such was the case with the animal tribes. At all events, we know that both are now spread over regions which were once entirely devoid of most of them: and I cannot refrain from thinking, that the grand and benevolent purpose of Nature, in impressing the strange principle of migration on so many and such important orders of animated beings, was that of dispersing them over the

habitable globe as so many seeds of future increase, where man should be found to avail himself of the boon. That the cow, essential to the comfort and life of myriads, was origin migratory, like her kindred species, which, in their untam state, still remain so, I think analogy will induce us to believe, though it may be difficult to retrace through all its successive improvements, to its originally wild state, an anim so early domesticated. That deer are so, is quite certa they have evidenced this propensity more than once even in t country, intersected throughout, as it is, with inclosures. Th goose and the duck, on the latter of which, perhaps, mo human beings at this moment feed, than upon mutton, it needless to add, are still migratory, till domesticated. We the various kindred tribes of the moufflen added to the (and that this is migratory, though perhaps not so at stat periods, admits of little doubt,) which of the creatures mo necessary to human beings has not Nature distributed to the wherever they are, by virtue of this mysterious principle?

(106) But, to redeem this important part of my argumen in favour of a visible intention of Providence to sustain mankind, from the possibility of misconstruction, and, as I confidently hope, from all remaining obscurity, let me make o simple observation, to which I again invite attention, as sufficiently curious, and, as far as I know, entirely new.

(107) Of all the migratory tribes, those, and those onl are capable of being domesticated and retained, that ar serviceable for human sustentation. I admit such is the bounty of Nature, that most of her larger animal tribes are so still, however, there are some which are not so intended to be these it is out of the power of man to multiply or detain.

(108) To give but an instance or two of this most importan and interesting rule, which I believe to be without an exception. The wild duck, which obeys this impulse, as we have seen, in its natural state, as regularly as the rest of the migratory birds, and which appears as restless to do so if interrupted in her purpose, is nevertheless made to yield a part of her very nature, and becomes as voluntary and constant a resident with human beings as though she had no wings; and she is not only wholly domesticated, but is far more prolific tame than when wild: I assign for the fact this plain reason: she constitutes a part of the

appointed food of man. But the swallow, with her kindred tribes, who travels so many thousands of miles to clear our summer skies from their clouds of insects, fixing near our habitations for that purpose, is not destined to form part of our repasts. Nature, whose orders she never exceeds, has commissioned her accordingly; when, therefore, her office is performed, and the necessity for her has ceased, no arts can tempt her to stay among us; no cares continue her in life if she be forcibly detained. In like manner, the nightingale comes in that joyous season when Plenty overflows our plains, and cheers contented labour retiring to its rest, breathing her song

> ——— into the reaper's heart,
> As home he goes beneath the joyous moon.

But she is not profitable for human food, and consequently nothing can detain her through the remaining year. Then, however, when the earth is bare, the goose and the duck succeed: but they consent to remain with us; and make to our edible stores a substantial and grateful addition, which, did our necessities require, or our preference direct us more particularly to, this kind of food we could increase almost at pleasure, by artificial incubation, as was formerly the case in Egypt, and still remains so in China. The latter bird, I should conceive, could, in three or four years, be thus made to multiply into more birds than there are human beings in England.

(109) In closing these thoughts on the nature and objects of the migratory principle in animal creation, I would pause to ask, who can trace, even in a single instance, those dependent and connected laws of Nature by which these supplies are afforded to man? Who can trace the different stages of their progressive preparation, or measure, even in thought, the vastness of the repast which is ever pouring forth in its full maturity? Deep in the unfathomable ocean, or concealed in the wild and wooded wastes of the inaccessible north, the mighty process is, while we are thus feebly essaying to speak concerning it, proceeding unobserved, in a never-ending succession of renewals and completions. Meantime, these innumerable flights are almost untouched, and the inexhaustible bounties of the ocean barely tasted; and no wonder; for the mother Earth herself, nowhere fully cultivated, lies in many of her most fertile regions

totally neglected. Man, nevertheless, age after age, has become more and more fastidious in the choice of his food, and more profuse in its use; till, in this period of culpable luxury, the cry of prospective famine is raised: a cry, of which all the elements re-echo the falsehood, and which rises to the throne of the Eternal as an insult on all those perfections through which he condescends to the very senses of mankind.

(110) Having thus attempted to shew, though in a very imperfect and partial manner, but sufficiently, I hope, to prove the constant care of Nature to sustain all her offspring, and, more especially, to spread the table of man, whether by plainer viands, which are produced in such profusion around him, or by those varieties which she furnishes with such constant attention to his gratification, from every element and from all parts of the globe, it may perhaps be permitted to me barely to repeat what has been before shortly alluded to, for a different purpose;—the equally certain and astonishing care which she perpetually takes to clear it, especially in those climates where the remains would, if left, interfere with his comforts or be fatal to his life. Before I attended to this part of the economy of Nature, I have been often surprised to think how few are the instances of animal mortality which we observe; how few carcases are found in our fields, even of such of the smaller animals, whether birds, or quadrupeds, or insects, which so greatly abound. But, when I reflected that there are different classes of beings in every element, for which Death is the purveyor, surprise indeed ceased; but admiration succeeded, and I became sensible that this ordination, also, was one of those many negative mercies of the Almighty, if I may so express myself, which can never be duly estimated, as, perhaps, in most instances, they are never known, the evil being prevented before they are felt, or even feared; and I have no doubt but Nature is full of these provisions, could we detect them. I have denominated these tribes the scavengers of creation; and they still further warrant the illustration, in that, with us, they generally perform their office in the night. But were we to witness the increased necessity of this important office, as it occurs in climates less antiseptic than our own, we should see distinct tribes of animals perpetually engaged in it: the pelicans and cranes of Egypt, for instance, as Hasselquist informs us, and the gallinazos of South

America, which, as the Ulloas mention, consume the carrion and ordure there, that would be otherwise so deleterious. But I have only returned to these ideas, important as they are, for the further purpose of confirming the sufficiency of the sustentation provided for human beings, by a reason which cannot but have weight with all who are not proof against every argument grounded on moral perceptions. Man rejects this species of food; and the instinctive disgust with which he does so, rooted in him by Nature, is a superadded proof that for him she has otherwise provided.

(111) I shall not add another to the order of proofs I have exhibited. I think them sufficient to manifest the intention of God: beyond this, all is surely needless, if not profane.—Another appeal, however, is open to me, not thus circumstanced, and I shall make it in few words.

(112) The heathen philosophers, as it appears to me, pursued a system of reasoning which is strictly applicable to the present subject. Indeed, they built the sublimest of their notions, those touching futurity for instance, on a basis which they deemed a demonstration; and one that, if there is the least truth in it, is at once decisive of the present argument. They inferred immortality, from the intense desire for it implanted in the human soul; because, as far as they had scanned Nature, they saw no desire without its appropriate gratification. And who can gainsay this mode of reasoning? Thus argues Plato, and, after him, our English Plato, Addison; and, independently of the more solid ground on which the doctrine rests, this is the strongest natural argument, to me at least, which presents itself in favour of immortality. Well, then; the same argument stands still more prominently forth, as it respects my present position. The desire is at least as intense for present, as it is for future and continued, existence; and this craving cannot be gratified without sufficient food; if, therefore, there be any truth in the ancient method of deduction, sufficient food is prepared wherewithal to gratify it. Let us advert to the other desires, faculties, or powers of Nature. For which of these has not its Author provided an adequate and appropriate gratification? Take the eye, for instance; are not there objects sufficient to fill its vision? is not there light enough to make those objects perceptible? Wonderful are the adaptations, whether anatomical, atmospheric, or even mechanical, which

meet in the astonishing phenomena of sight! Are they, I would ask, more wonderful, more complex, more necessary, than those which are connected with another sense, and that to which sight is plainly subservient, and on which it instantly depends? On the philosophy of vision I shall say nothing: lectures on that subject, delivered in this place not long ago, are present in our recollection, and render that unnecessary—I would merely ask, whether the sense to which I am now alluding,—that of taste,—connected with all the anatomical and physical apparatus to which it plainly subserves, is less complex, is less wonderful, is less necessary,—in fine, is less obviously adapted to the end designed—human sustentation, than that of sight? And if not, I then extend my appeal. If, when the latter sense is awakened, it opens to a flood of "bright effluence of bright essence increate," perfectly sufficient for its purpose,—namely, to drink in the surrounding works of the Deity,—can we, can any man, believe that that eye must wax dim, and become dark for ever, because another and a neighbouring sense, on which all the rest depend, which equally longs for gratification, and is equally capable of being gratified,—has no supply of its natural wants and desires, but is doomed to suffering, privation, and destruction? No! The mouth, the teeth, the stomach of man, are guarantees that GOD has provided him with subsistence,—these are "patents for food" that the Deity himself has granted,—proofs, indeed, that numbers and food are balanced.

(113) Believing, then, with the philosophy of antiquity, in the power, the wisdom, and the benignity of the Deity, the argument becomes sacredly plain. He, on whom all things depend; for whose pleasure they are, and were created, Himself has made us with this necessity; Himself has ingrafted in us this imperative desire, and connected it with pleasure and vitality; Himself has provided for its gratification. To create the necessity, to calculate the supply, and to afford it, are equally his care. In his other works he becomes visible to us in the calm lights of reason; in this he descends in the blaze of his universal benevolence.

(114) If it be remarked that, in these latter views of the subject, I have connected the supply of animated existence with the Deity; I confess it: and I defy human sophistry to treat the subject in any other relation, except at the expense of

sacrificing those perceptions common to our nature, and which distinguish us from the brutes. All antiquity so connected it, not only theoretically, but practically; not only in its generalities, but even in every particular distribution of it to man. Hence the libation was poured; hence the sacrifice devoted, on every festive and public occasion. They traced the bounties they enjoyed through the series of secondary causes, up to the First Great Cause, and were thankful. Thus is it that the father of verse, as the priest of unenlightened antiquity, Homer, exhibits, in his unrivalled manner, that connexion of causes and effects, to which I have alluded throughout, as that golden chain grasped by the hand of the Artificer of the Universe, every link of which is rich in its materials, elaborate in workmanship, effulgent in splendour, and mighty to sustain the weight of the universe, which it incessantly upholds. Nor has the prevalence of a more perfect theology, or a more enlightened philosophy, surrendered the idea of the dependence of all Nature on the first great cause; but on the contrary, has still further enforced and illustrated it. These, as with one voice, which hath gone out into all lands, instruct us to believe that, whether in the fabrication of the heavens, or in the formation of the earth, with all their various train of phenomena to which we have faintly alluded in the former parts of this discourse, we still contemplate the designs of Infinite Wisdom engaged in works of never ending benevolence,—of Him, who by his excellent wisdom hath made the heavens, for his mercy endureth for ever! Who giveth food to all flesh! for his mercy endureth for ever! Of Him, who by his almighty hand which made all things, and impressing, as the means of preservation, the desire of food upon all things living; satisfies, therefore, the desire of every living thing;—who openeth that hand, and filleth all things living with plenteousness. Thus is it that the most untutored, as well as the most experienced eye recognizes the present Deity,

——— sees the sacred hand
That ever busy wheels the silent spheres,
Works in the secret deep, shoots teeming thence
The fair profusion that o'erspreads the spring:
Feeds every creature.
And as on earth this grateful change revolves
With transport touches all the springs of life.

(115) I pursue this argument no further; but, lastly, make an appeal to the senses, which, indeed, must finally decide all questions, however abstruse they may be in their principles, however elaborate in their details. Lastly, therefore, I point to the actual condition and existence of animated beings, in full proof that their numbers and food are balanced. Nothing below the sun can be more evident, than that if the former overbalance the latter, misery, co-extensive with the evil I am denying to exist, that is,—universal and unceasing,—must be the result. Nothing can be clearer than that animal happiness is totally irreconcileable with an insufficiency of food. In this proof, at length, we are in broad day-light, if I may so express myself; the eye of the deepest philosopher, however assisted, may have been inadequate to discover, in a sufficient number of cases, that precise and necessary connexion throughout the various parts of animated Nature, for which we have been contending; the profoundest reasoner may fail in arranging the facts which may be apparent, and making the necessary deductions from them, so as to be universally successful in the high and interesting argument we have been pursuing; but the eye of the simplest rustic is fully capable of discerning those results, which must for ever decide this question;—results, neither doubtful nor disputatious, which cannot be overlooked, nor by possibility be mistaken. The senses instantly apprehend them, and transmit their import at once to the understanding and to the heart.

(116) If there is the alleged tendency in all animated life to increase beyond the "nourishment provided for it;" if Nature has scattered existence with profusion, but has been sparing in its sustentation; then must there be universal misery through every tribe of those irrational beings, to which I am now exclusively alluding. I appeal to human experience, if this be the case. To advert to that part of animated Nature, of which man takes little or no heed, and which is generally removed beyond the limits of his interference: I ask, are they seen multiplying around us in unsustainable numbers? After having represented Nature as an arena of universal carnage, where her offspring are

Never ending, still beginning,
Fighting still and still destroying,—

are these warring germs of existence, though still feeding upon each other, starving? Does Nature, I ask, exhibit these scenes of unceasing strife and confusion, where slaughter is the sole and evident business of life; to which want and famine are to be superadded, to rectify the constant tendency to redundancy? Do the insects sport awhile in the air, and, before their natural date of being, drop by exhausted myriads, and strew the ground with expiring animation? Do the birds pour their faltering and unfinished songs, and, adorned with the mockery of beauty and gaiety, drop from the branches, and flutter, and die at our feet? Do the fishes, increasing so as to spread the devastation through the other element, become torpid and expire by millions, till the pure medium to which they appertain is polluted with their floating carcasses? Or, if these queries be dismissed through the door of absurdity, by saying that the constant tendency of all these tribes of beings to have too little food, is accompanied by a constant tendency to an excess of it; which is precisely the argument founded on mutual destruction, as the case is put by those who maintain the superfecundity of all animated nature; to stop at once this loop-hole of retreat, let us ask whether those animals, on which none others prey, are, in their native haunts, seen in this constant state of inanition and death, which would be the inevitable consequence of their increasing beyond the balance of their food. Is the eagle of the north seen thus pining away; with that eye which lit its fires at the meridian blaze faded; with those pinions with which he once scaled the heavens, drooping; and the mighty talons with which he was wont to strike and destroy, powerless and relaxed;—dying for want of food? Or is the majestic monarch of the animal creation, the lion, found in his native seats, thus subdued and quailed by want, till, weak and cowardly, he becomes the ready prey of every careless obtruder: or otherwise has he to raven on his species in default of other food, till his haunts are strewed with the carcasses of his own kind? I repeat the question, is the scene of Nature one of general suffering, agony, and death? No:—such a condition, as it respects the universal number of existences, is as a single exception to the vast plurality of cases; as it regards that single exception, the moment of actual suffering is probably short, in comparison with the allotted term of enjoyment; nor can even that individual instance be traced to an insufficiency in the general provision of Nature for all animated beings.

(117) Turn we then from the view of this phantasma, formed by distorted principles and distempered feelings, to the contemplation of Nature, in the sober lights of philosophy and truth. Let her secluded haunts be open to the inspection, I care not of whom, so that he have an eye to see, and a heart to feel, the happiness of her animated progeny. Without sending such a one with Humboldt to the southern regions, swarming with universal animation; or with Acerbi to the north, which, notwithstanding our notions of it as a dreary solitude, is probably, both on earth and ocean, at least as luxuriant of life, let him penetrate into the wilder scenery with which this country even yet abounds, or lose himself in the seclusion of some of those afforested demesnes which still exhibit Nature in her loveliest, because most unconstrained, attitudes, and which recall to our ideas that paradise which the poet of England has taught imagination to restore. There, on the wane of some summer's day, and before the animal tribes have retired to their timely repose, let him lay himself down upon "the sloping cowslip-covered bank," and, shaded by a canopy of flowering and luxuriant foliage, look and listen. He will find, according to a celebrated observer of nature, all the animal tribes, down to the insects, wallowing in luxury; or, as Paley says of them, "so happy as not to know what to do with themselves." Close to his eye, to which the clearness of the air and the nearness of the objects give a sort of microscopic acuteness, he sees innumerable insects, many of which, if he is not a practised entomologist, are minute and brilliant strangers; and if he is, are constantly putting his knowledge to a severe test; all full of life and enjoyment, leaping about with incredible agility, climbing up the spiry grass, or disporting on the flowers with which it is embroidered: amongst these the bee is plying its busy harvest, and filling up every interval of labour with its song; a conspicuous example, perhaps, of the happy business of every inferior wing. If he chance to look to the roots of his verdant pillow, still he sees nature swarming with animation; innumerable terrene insects strike his notice, many of them, perhaps, resting during the sultry hours, but whose labours he would have witnessed had he been there at the dewy dawn instead of the close of the day,

in innumerable shining threads suspended from every point of grass, and investing the whole surface of the meads with a film of inconceivable fineness and lustre. Whichever way he looks, there is not a plant or a flower without its appropriate population. Further from him he sees throngs still more innumerable,

> Which flutter joyous in the solar beam,
> And fill the air, or float the dimpling stream,

all expressing, as far as motion and appearance without language can express it, the utmost measure of enjoyment. Nor are even sounds wanting to signify the reign of universal pleasure. Far more unequivocal than the busy noise arising from the crowded haunts of human beings, is that continuous murmur of unnumbered wings, and the ceaseless hum, with which their universal occupation is plied, which soothes and falls upon the ear in one continued and unbroken unison, save when the exulting songs of the painted birds, responding in innocent rivalry, add melody to this pleasing and perpetual note of harmonious nature. In the shallows of the clear stream which flows babbling at his foot, he sees multitudes of existences which flit along like living shadows full of activity and pleasure: while dimpling its surface, or gathering in clouds above it, another order of beings, that of insects of different tribes and various degrees of brilliancy, are disporting; forming a world of their own, replete with equal plenty and joyousness. The wild animals meantime occasionally scud past him, intent upon their pastime, from which his intrusion on their haunts startles them; some of the nobler ones, whose stately forms excite his admiration, gaze at him at a distance, and pass on. Through an opening vista of the wooded solitude, he sees a whole herd of these moving as by one impulse; every motion as buoyant as though they were almost aërial. And far beyond the bounds of the surrounding domain, a still more magnificent prospect spreads before him. The surface of the earth, to the distant horizon, is tesselated with enclosures, and glows with many-coloured crops. Here the pastures are clothed with flocks; there the valleys are covered over with corn: the little hills rejoice on every side; they shout for joy, they also sing! Human habitations are sprinkled over the prospect, like gems on the mantle of Nature; and here and there they cluster into a town; while the temples of Divine worship, "which point with taper spire to heaven," are seen rising as far as the eye can stretch, and crown the happy prospect with the proof, that mankind are neither insensate, nor ungrateful; that they know who it is that "gives them rain and fruitful seasons, filling their hearts with food and gladness." He gazes till the tints of day fade, and the glorious prospect recedes from his sight. The busy tribes of life are hushed in repose, one solitary and unrivalled songster only keeps up the vigil in the temple of Nature, but in what strains does she "charm the listening shades, and teach the night His praise!" He looks up and beholds the eternal stars successively rekindling their fires, and resuming their courses; and the moon walking forth in her brightness. All the near and transitory scenes of Nature thus cut off, the soul calls home its scattered thoughts, and centres them in loftier meditations concerning that mysterious Being, whose works it had just been contemplating, and who now appears more intimately and awfully present. He rises, and retires to his wonted place: in a frame of solemn devotion which recognizes the Deity alone, and him only in his one sacred attribute of unbounded and everlasting goodness.

(118) Such are the feelings which the undisturbed contemplation of Nature has ever inspired. Hence was it that those strains were poured forth by one of the earliest and sublimest of the poets, probably composed in the recesses of Nature, during many a solemn night; when he was feeding his sheep in the wilderness. Most of his divine odes make these perpetual appeals to the surrounding works of creation which I have been attempting: Linnæus, in the little tract I have in my hand, which is one of the earliest of his efforts in that immortal field which he afterwards made his own, commences with a quotation from one of these, with which I shall conclude:

> O JEHOVAH,
> QUAM AMPLA SUNT OPERA TUA!
> QUAM EA OMNIA SAPIENTER FECISTI!
> QUAM PLENA EST TERRA POSSESSIONE TUA!

END OF THE SECOND VOLUME.

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